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Sorgho, or Chinese Sugar Cane.

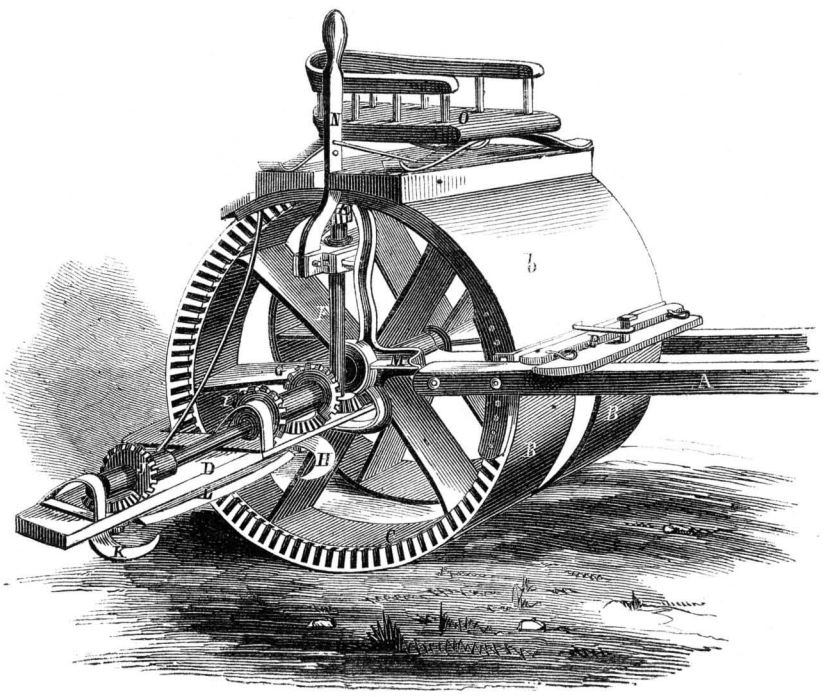
The Paris correspondent of the *Journal of Commerce* says that the sorgho, or Chinese sugar cane, which has attracted so much attention, formed a prominent feature in the late annual agricultural exhibitions of France. This plant is extensively and successfully cultivated in the south of France and in Algeria; and as an evidence of the extent and variety of the application of its material we may mention that at the late exhibition at Avignon, M. Prieur exhibited a group of samples illustrative of the metamorphoses to which he has subjected it. Nothing could be more curious than the succession of transformations there shown. In one corner could be seen the sorgho in stalk, such as it is when cut; a little further, were its fibres converted into thread, in skein; then a piece of linen woven with the thread; then a handsome cloak bordered with furs, which M. Prieur designs for the Prince Imperial.

The most curious and complete array of the products of the sorgho, however, at the same exhibition, was that of Dr. Sicard of Marseilles. With the pith he has manufactured excellent sugar, which will favorably compare with any other whatever. By grinding the seed he has obtained flour and fecula, of which he has made bread and chocolate, which the many tasters have found palatable. He extracts, moreover, from the plant an abundance of alcohol of superior quality, and besides, a most agreeable wine, containing in large quantity all the tonic and other salutary elements of the juice of the grape. In addition, he makes paper out of it, of which he showed evidence in superior samples; by chemical agents he gets from it gamboge, ginseng, carbon; skeins of cotton, wool and thread dyed with sorgho in those delicate and varying shades which hitherto have been found only in the stuffs and articles coming directly from China. We should add that the new derivations (as we may style them) from the cane are complete, and can be delivered to trade and industry at determinate prices.

Manufacture of Coke.

A patent was recently issued in England for an invention which consists in so constructing coke ovens that they shall be in communicating pairs, the waste gas and heat from each oven being made to surround, or partially surround, its fellow, by means of flues, before passing into a chimney or the open air, so that by charging each oven composing a pair alternately, neither is allowed to get cold, and it is said that by this process the operation of coking is carried on with greater economy and expedition. It is preferred that the ovens be placed in pairs, back to back, but this observance is not indispensably necessary.

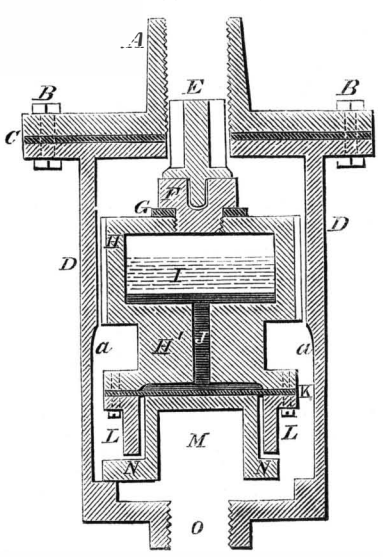
TILTON'S STALK CUTTER.



This machine is designed to cut standing corn, the center wheels passing between the rows, and there being a cutter bar on each side, it cuts two rows of corn at once. Our engraving is a perspective view of the machine, showing thoroughly the construction and arrangement of the parts, A being the shafts, and B the traction wheels which rotate as the machine is drawn along the ground, and by means of a cog wheel, C, on their outside edges, they give motion to the cutters. The shafts and cutter bar are attached and suspended from the axle of the wheels by the yoke, M, which is of metal and sufficiently strong to support the weight and strain upon it. P is the whiffle-tree to which the horses is attached. From the shafts, A, there extends up a cover, *b*, on the top of which is the driver's seat, O, from which, without moving, the driver can throw the cutters in and out of gear as desired by the lever, N, which is connected with the journal in which the vertical shaft, F, with its pinion, E, rotates. The lower end of this shaft, F, has a bevel wheel upon it that gives motion by another wheel, G, to a horizontal shaft carrying bevel wheels, I J. This horizontal shaft and gearing is on the top of the cutter bar, D, on the lower side of which cutters, H K, move by their axis passing through the cutter bar, and terminating in bevel wheels which are rotated by I and J. To the underside of the cutter bar, D, a stationary cutter, L, having a curved shape, is placed, and the moving cutters being sickle-shaped, they take in their rotation, as the machine is drawn along, a sickle-full of corn stalks and bringing them against the stationary cutter, L, cut them evenly and clearly off, which is the great advantage of sickle-shaped cutters. Two or more cutters can be placed on one shaft, so that each machine will have eight cutters, there being a bar and connecting pieces exactly similar to the one described on the other side of the wheels, B.

The machine works well, and it is remarkably simple and complete, compact and strong. The inventor is William S. Tilton, of Boston, Mass., from whom any further information can be had. It was patented June 17, 1856.

Hoard & Wiggins' Trap Valve.



The vast length of pipe which a building of any size requires when it is heated by steam, gives, of course, a large cooling surface, and the steam becomes at first rapidly condensed into water, which, if not removed, prevents the operation of the heating arrangement. To remove this water, and yet prevent the escape of any steam, and to allow all the condensed water to escape as fast as it is condensed away, so that it may not absorb any of the heat which should be employed in elevating the temperature of the building, has long been a desideratum, and has at last been invented by J. W. Hoard, of Providence, R.I. The device is small, being only six inches long by four in diameter, and it cannot freeze.

Our illustration is a section of one of these valves, which we will now proceed to describe. A is the cover, which is connected to the end of the heating pipes, and may be any distance from the building. It is attached to the cylinder by bolts, B, an india rubber packing being interposed between them. In the bottom of the case or cylinder, D, is an escape pipe, O. E is a feathered valve, stepped into a nut, F, and it does not rest on the step, but on the top of the nut. This nut, F, completely closes, by means of an india rubber packing, G, a box, H, which is smaller than the inside of D, so that plenty of water way is obtained between the inside of D and the outside of H, and it is prevented from shaking, and compelled to move steadily up and down D by three projections cast on its outside. This box is hollow, and contains mercury, J, which fills up the narrow tube, H′, and presses, in the extended hollow, on the diaphragm of rubber, K; above the mercury is a small quantity of alcohol, I. To the under surface of H is attached by bolts a cylinder, L, which fits loosely around a cap, M, that covers the exit, O. This cap, M, is supported over O by a trident base, N, so shaped that it is firmly secured over the opening, and yet admits of plenty of water way.

The operation is as follows:—When the steam is turned on it rushes through, A, (the valve being always open when steam is not in contact with it, so that all water can run out of the pipes when not in use for heating) and coming in contact with H, heats it, and vaporizes the alcohol. The alcohol vapor being confined, presses on the mercury, and causes it to expand the diaphragm, so that the whole of H is lifted up by the pressure of K upon M, and the feathered valve, E, closes A. It remains closed until water has accumulated, when the alcohol cools down, resumes its liquid state, and the water runs through. The case, D, is chamfered out at *a*, to increase the water way, and the device works, after once beginning, giving a regular stream of condensed water, and not by jumps, as would be supposed, no steam ever passing through. We have seen certificates from various manufacturing establishments where steam is used for heating and evaporating purposes, and where this trap valve is in use, and all speak in the highest terms of its operation, as it enables them to keep the steam in the pipes at the same pressure as in the boiler, and allows the escape of all the condensed water. It is a simple and useful little contrivance, and recommends itself for general adoption.

It was patented May 25, 1858, by the inventor, who has assigned the invention to himself and G. B. Wiggins, 20 Friendship st. Providence, R.I., either of whom may be addressed for further information.

Electrical Phenomena.

Mr. L. R. Breisach, to whom two patents were lately granted for ventilating chairs, has noticed that if any air be forced from bellows through tubes, electricity is developed. It is supposed that air so charged will be beneficial to nervous persons, and much easier of respiration by persons of weak lungs than the common atmosphere. We cannot see on what facts these suppositions are based, for if they be correct, persons living in a place where clouds that have swept over a mountain side, and that are full of electricity in a highly excited state, come in contact with them, should be very healthy indeed, instead of being, as they are, subject to epidemics and such diseases as *goitre* and the like.

Profitable Mining.

At the Freiberg mines, which are nearly the oldest in Germany, they have made a most lucrative discovery. In a mine which has been profitably worked for the last 120 years, large lumps of metallic silver have been found, each weighing from 3 to 12 pounds; the largest lump weighed 60 pounds, and was in the form of a side of bacon. This would seem to be a reward for scientific mining, as these mines are worked entirely on the results of scientific investigation conducted by the professors of the mining school in that place.

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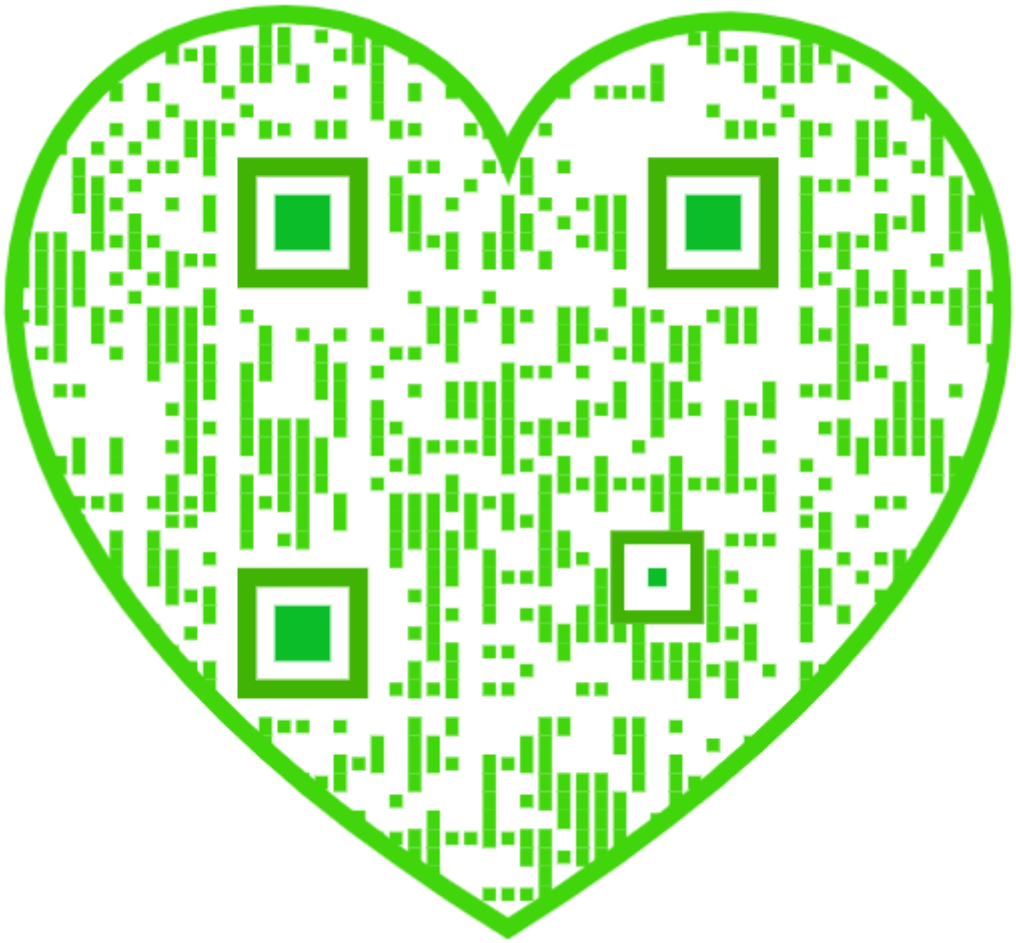

Issued from the United States Patent Office

FOR THE WEEK ENDING JULY 13, 1858.

[*Reported officially for the Scientific American.*]

KNITTING MACHINES—Nelson P. Aiken, of Troy, N. Y.: I am aware that it is not new to use a belt-shipping apparatus in a knitting machine, to move the belt from the driving to the loose pulley, when the yarn breaks or gives out, and therefore I do not claim broadly this as my invention.

But I claim the arrangement of the shipper or belt-shifter, G, in the manner substantially as described, and in combination with the movable stop, H, lever, M, and sliding bar, K, when controlled by a sinker wheel, or by any wheel gearing with and moved by the needles, for the purpose set forth.

[A notice of this improvement will be found in another column.]

SPOKE-SHAVE—Leonard Bailey, of Winchester, Mass.: I claim the improved spoke-shave, as constructed with its bearing surface in front of its cutter, applied to the stock by means of a lever having an adjusting screw, or its equivalent, or a screw and a spring applied to it, so as to enable the said bearing surface to be moved with respect to the cutter and the bearing surface in rear thereof, substantially in manner as described.

I also claim the arrangement and application of a protecting cavity or chamber within the lever, and to the spring thereof, in manner and for the purposes set forth.

KETTLES FOR RENDERING LARD—John J. Bate, of Brooklyn, N. Y.: I claim providing a means of communication between the exterior and interior of the heater, C, by the apertures, D D', so that the contents of the kettle and the heater can communicate with each other, as and for the purpose set forth.

SPRING PULLEY FOR WINDOW SASHES—Dana Bickford, of Westerly, R. I.: I do not claim either of these devices separately.

But I claim the combination of the friction wheel or its equivalent, and the bearings of the pulley with the lip, as described, in connection with other parts of the spring balance.

MACHINES FOR CUTTING PAPER—Milton B. Bigelow, of Boston, Mass.: I do not confine myself to the precise mechanical devices described, as they are susceptible of various modifications.

It is very obvious, for instance, that V-shaped rails might be employed for sustaining and directing the sliding carriage and cutting-board in their movements; also that a short shaft with a crank and pinion on it, might be attached to the frame, said pinion being made to engage in a gear wheel affixed to the rock shaft, O, for the purpose of moving the cutting board and paper.

But I claim the described mechanism, or any other essentially the same, by means of which the cutting board is prevented from moving in any other direction than a straight line, in its horizontal motions, said mechanism consisting of the guide rails y, y, and the sliding carriage, v v, constructed and operating in the manner substantially as and for the purpose specified.

I also claim actuating the sliding carriage, v v, and with it the cutting board, x, by means of the mechanism described, or any other essentially the same, said mechanism consisting of the levers, q and r, the rock shaft, o, and the straight lever, p, connected and operating in the manner substantially as and for the purpose specified.

DOOR PLATES—Jeremy W. Bliss, of Hartford, Conn.: I claim the perforated door plate, A B, bell arrangement, I J K P N O M, constructed and arranged to secure the three-fold object, substantially in the manner and for the purpose as described.

MACHINES FOR HULLING RICE—Joseph S. Bossard, of Sumterville, S. C.: I claim the employment or use of the arms, b b d, attached radially to the rotating shafts E, in connection with the projections, c c d, on the pestle shafts, C, the parts being arranged to operate as and for the purpose set forth.

[This is an improvement in that class of machines for cleaning and hulling rice in which pestles or pounders are used for effecting the purpose. The invention consists in a novel arrangement of arms attached to a horizontal rotating shaft for elevating the pestles, whereby the pestles or pounders are elevated the requisite distance by comparatively short arms, and consequently with a corresponding diminution of power.]

MACHINES FOR DRESSING HIDES AND LEATHER—John R. Bumgarner and Lyman White, of Davenport, Iowa: We claim, first, The combination, by means substantially as specified, of two carriages, B D, moving at right-angles to each other, one having an intermittent longitudinal motion, and serving to feed the hides or skins to the action of the dressing frames, and the other, D, having a transverse reciprocating motion, and serving to carry and move the dressing frames across the hides or skins, as set forth.

Second, The peculiar manner of constructing the intermittent carriage, B, in sections, and with long and short clamps, c c, whereby hides or skins of different sizes can be clamped and distended on the same, substantially as and for the purposes set forth.

Third, The automatic device, G, specified, for clearing the knives, x x, just after the completion of their movement from one edge of the hide or skin to the other, of all matter which may have accumulated on them, and which would be likely to clog their action, as set forth.

Fourth, The arrangement of the standards, q q q q, set screws, r r r r, levers, s s s s, cords, t t, and windlass shaft, u, substantially as and for the purposes set forth.

Fifth, The combination of the windlass shaft, u, with the dressing frame carriage, by means of the ratchet movement, S T, and the projection, U U', substantially as and for the purposes set forth.

[This machine is designed for unhairing, fleshing, scraping, dressing, and finishing hides, these several operations being performed successively. The hides are clamped upon a table which has a gradual longitudinal movement, and are continuously operated by the unhairing, fleshing, scraping, and finishing frames, which reciprocate across it in a direction at right angles to the movement of the table. This, we believe, is the first machine which has been patented for performing the whole operation of converting hides into leather, and if it operates well in practice, will be a great labor-saving machine.]

PROPELLER FOR CANAL BOATS—Abner Burbank, of Buffalo, N. Y.: I claim a propeller and shaft, movable in a longitudinal direction, in combination with a rudder having a notch or recess therein, to receive the propeller, and for the purposes and substantially as set forth.

ROCKING CHAIR—Isaac P. Carrier, of South Glastenbury, Conn.: I claim the arrangement of the frame or arms, E, rod, F, springs, stud, H, and the pin, c, holes, C, substantially in the manner and for the purposes as described.

MACHINE FOR CUTTING BARREL HEADS—A. H. Crozier, of Oswego, N. Y.: I claim first, The disk, M, constructed and operated as described.

Second, The method described of connecting the saw and cutter, so that both are controlled by the same winch or lever, substantially as specified.

Third, Attaching the saw to a sliding stock, as and for the purpose described.

BUSTLES AND SKIRTS—Handel N. Daggett, of Attleboro, Mass.: I wish it distinctly understood that I lay no claim to the invention of the adjusting cord, as applied to a bustle or a skirt.

But I claim the improvement or combination of the back strut with the bustle or skirt and the adjusting lacing, such being applied and made to operate as and for the purpose specified.

TOOL FOR CUTTING CYLINDRICAL OR TAPERING STICKS—George Davies, of Duquesne, Pa.: I claim the combination of the cylindrical stock, a, adjustable block, K, and bit, F, constructed and arranged as described, forming an improved tool for cutting round or tapered sticks for handles, &c.

FORCE PUMPS FOR FIRE ENGINES—John N. Dennisson, of Newark, N. J.: I claim increasing the capacity of the pumps of fire engines near the end of the stroke, by the expedients described, or their equivalents.

CLOTHES'-DRYING APPARATUS—Olonzo R. Dinsmoor, of Auburn, N. H.: I claim the combination of the endless clothes'-line, the sheltering shed or building, and the stretching apparatus, the whole being made to operate substantially as specified.

I also claim combining one or more travelers, K, with the endless clothes'-line applied to a building, and a stretching apparatus, and constructed so as to operate essentially as described.

METALLIC HUB FOR CARRIAGE WHEELS—Nathaniel T. Edson, of New Orleans, La.: I claim, first, The cone, H, when made and applied in the manner substantially as specified.

Second, The oil chamber, 5, in combination with one or more orifices, 4, when formed on the outside of the box by means of a nut, substantially as represented.

Third, The combination of the oil cup, B, with the cone, H, for the purposes specified.

Fourth, I claim the chamber, 5, substantially as described, in combination with the outer cup, B, for the purposes specified.

SAWING MACHINES—Henry Featherstone and Peter Engman, of New Orleans, La.: We claim, first, The lateral movement of the saw, as represented.

Second, The suspension guides, with their cups and balls, as applied here, to guide the saw and its connections with the saw shaft.

Third, The back-bone rack connecting the truck.

Fourth, The truck and dog, with their movement, by means of the sector and rack, all as shown.

RAILROAD CAR BOX CASES AND PEDESTALS—Jacob C. Grisendorff, of Cincinnati, Ohio. I claim the employment of the lugs, C C, formed on box case D, when used in connection with the notches, b b, (two or more) formed in the pedestal, E, substantially as described, for the purpose of readily detaching or removing the box from the axle, yet retaining the box case in a proper position in the jaws of the pedestal, in the manner set forth.

WASHING MACHINE—B. F. Ghormley, of New Frankford, Ind.: I claim the combination and arrangement of the fluted and grooved roller, B, and the cords, a a, and roller, C, with the hinged washboard, D, springs, c c, and temper screws, d d, all being operated and constructed in the manner and for the purpose fully described.

TRAPS FOR ANIMALS—Samuel Gibson, of Martic Township, Pa.: I do not claim the tilting floor and parts separately.

But I claim the chambered box, wire drop cage, and tilting bottom, when combined and operated substantially as set forth.

PRINTING PRESSES—George P. Gordon, of New York City: I claim, first, One or more sets of gripers or nippers, independent in themselves, which shall revolve upon their axes, and carry the sheet from its point of feeding to its place of deposit, whether operated in the precise manner described, or in some equivalent way.

Second, I claim the "stop," or its equivalent, for holding the said gripers, or their equivalent, in the desired position, for the purpose of insuring an exact and regular feeding, registering, and delivering of the sheet as fully set forth.

Third, I claim one or more sets of gripers, (which revolve upon their axes) having a movable base, with fingers to close upon said base, and hold the sheet, whether constructed in this precise manner, or in some equivalent way, to produce a like result.

Fourth, I claim the combined action of said gripers and the vibrating springs, strips or frisket, for the purpose of conveying the sheet to, and receiving and holding it in the proper position for the reception of the impression, and insuring its proper delivery after it shall have been printed.

Fifth, I claim the vibrating double cam for throwing off and on the impression.

Sixth, I claim two or more distributing rollers, having a lateral motion upon a main distributor, which shall move independent of, and in opposite direction to each other, and thus alternately cross and recross each other's distribution, for the purpose of giving an uniform inking.

Seventh, I claim the relative arrangement of the feed table, the fly board, the platen and the bed, substantially as described, in combination with the revolving gripers.

Eighth, I claim the two distributions given to the inking rollers upon one cylinder for each impression, (heretofore patented by me) in combination with the rotating reciprocating bed with its spring extensions, as fully set forth.

Ninth, I claim the fly board with its adjustable ledge in combination with the gripers, to insure the even piling of the sheet, whatever its size may be.

FIRE ESCAPE LADDER—Joseph H. Grimsley, of New Lexington, Ohio: I claim the wheels turning on the axles at the ends of the wings or steps, for the purpose set forth, of providing a space between the ladder and wall for the feet and hands of the individual when descending, to enable and aid the ladder to reach the ground, said wheels being placed at the axle at the ends of the rungs, especially for this important purpose and object, viz., that with the wheels so placed it is of no consequence or difference which side of the ladder is uppermost when thrown out, making no difference which side of the same rests against the wall.

Also the straps, which, placed substantially as set forth, combined with a ladder of the necessary strength and weight, as small, enables a person of ordinary strength to rescue the aged, infirm, young, and those too timid to descend alone, by lowering them to the ground by the hand.

SHINGLE MACHINE—Erastus Hall and Joel F. Stewart, of East Randolph, N. Y.: We claim the rack, J, pivoted to the carriage, I, in combination with the rod, L, plate, F, pinion, u, and lever, G, with weight, H, attached, the parts being arranged as shown, for the purpose of feeding the bolt to the saw and gigging back the same automatically, as shown.

We also claim setting the bolt of the saw by means of the bar, M, provided with the rack, k k, operated by the backward movement of the carriage through the medium of the wipers, m m, and boss or hub, O, on shaft, N, provided with spiral ledges, n, and the spring catch, p, the parts being arranged to operate conjointly and automatically with the carriage, I, as described.

[A full description of this invention will be found on another page.]

METHOD OF COPPERING THE INTERIOR OF SHIPS, TO PROTECT THEM FROM LIGHTNING—Roswell W. Haskins, of Buffalo, N. Y.: I make no claim to lightning rods in any mode in which they are now used.

But I claim protecting vessels from lightning by means of metal linings, arranged substantially as described.

CHURNS—James Hatfield, of Falmouth, Ind., and Henry M. Goldsmith, of Burlington, Iowa: We claim, first, The manner and form of inserting the adjustable brakes, as described and shown.

Second, The basin or reservoir lid, with the glass slide attachment as described and shown.

Third, The quarter circle wings or dashers at each end of the shaft, in the form and position described and shown.

TAILORS' SHEARS—Bachus Heinisch, of Newark, N. J.: I do not claim elongating the upper blade of a tailors' shears, by means of an eccentric pivot.

Neither do I claim a stop set in one blade, and working in a curved slot in the other, as that is fully shown in Joseph Phares' improvement on tailors' shears, patented September 12, 1854.

But I claim the oblique rectilinear slot, C, in the elongated shank of the lower blade, A, in combination with the fulcrum, D, and lever, B, connecting the shanks, the whole constructed and operating substantially as and for the purposes set forth.

PUMP—George Hibsch, of Buffalo, N. Y.: I claim the two screw wheels, B B, constructed and operated as set forth, in combination with the bands, C C, when arranged in relation to the cylinder, A, in the manner and for the purposes described.

MACHINE PULLEYS—Caleb S. Hunt, of Bridgewater, Mass.: I claim the construction and use of machine pulleys with the bearing or band surface made of cork, as described.

SHOEMAKER'S EDGE PLANES—Freeman Killbrith, of Pembroke, Mass.: I claim the attachment to the edge now in use, and known as Dunham's patent, of the movable guard, C, with its screw, e, the guard being movable to and from the edge of knife D, and sliding on the face of the shank, B, and also the attachment to the shank, B, of the knife, D, with its screw, f, working in a slot, and raised or lowered to any desired gage for paring soles, and which knife, D, can be wholly removed from the shank, B, by unscrewing the screw, f, and so ground or sharpened, and be replaced by a new knife if necessary.

ADJUSTABLE PILE-DRIVER—T. W. Loveless, of Corning, N. Y.: I claim the frames, D E, connected by pivots or joints, c, and retained in desired positions by desired positions by the perforated segment plate, F, and pin, d, in combination with the bolster, H, and bars, h h, attached to the frame, D, as shown, and secured in desired position by the racks, J J, serrated plates, O, and bar or clamp, the whole being arranged substantially as and for the purpose set forth.

[A description of this invention will be found on another page.]

PAPER STOCK FROM REEDS—Henry Lowe, of Baltimore, Md.: I claim the prepared reed fiber, or new article of manufacture above described, as a substitute for rags, ropes, and other fibrous materials, for the manufacture of paper, said reed fiber or paper stock, being prepared substantially as set forth.

MACHINES FOR DRILLING AND SPLITTING STONES—John H. Lyon, of Baltimore, Md.: I claim the hammer stock, M, and hammers, N, arranged and operated as described, in combination with the drills, D, and removable slugs, E, for drilling and splitting blocks of stone, the whole being constructed and arranged for joint operation in the manner and for the purposes set forth.

CARRIAGE FOR SAWING MACHINES—A. C. Miller, of Morgantown, Va.: I claim arranging the head blocks in long mortises in the side pieces, F F, and connecting the outer ends of said head-blocks by overlapping arms or levers, H H, furnished with adjusting holes or an adjusting screw, so that any length of bolt within the capacity of the saw may be held and operated therein as set forth and described.

REAPING AND MOWING MACHINES—C. Moul, of Hanover, Pa.: I claim the combination of the truck frame, H, caster wheel, L, and lever, K, the whole being arranged and operated in the manner and for the purposes substantially as set forth.

ESCAPEMENT OF WATCHES—Jacob Muma, of Hanover, Pa.: I claim the escapement, consisting of a single escape wheel, A, and two geared balances, B B, with cylinders or cylindrical segments, h h*, engaging with the said escape wheel or opposite sides of its axis, when said escape wheel, A, and balances, B B, with their segments, h h*, are arranged in relation to each other, with their axes in the same plane, and the gear of the said single escape wheel, A, with the segments, h h*, serves the double purpose of escape and of giving impulse to the balances, as specified.

[A notice of this improvement will be found on another page.]

BOAT PROPELLER—Mortimer Nelson, of New York City: I claim, first, The vertical buckets, when arranged so that they shall be capable of folding against the side of the propeller frame, whether turned on their axis to the right or left, in combination with a reversible stop, which will, after being adjusted, hold the buckets in a position for acting against the water during the time the engine piston is making a stroke to effect the propulsion of the boat, either back or forwards, substantially as and for the purposes set forth.

Second, The arrangement of the buckets on the inner side of one of the propeller frames, and on the outer side of the other, in combination with the supporting slides, constructed and arranged substantially as and for the purpose set forth.

[This invention consists in arranging two longitudinal propeller frames set with vertical paddles on each side of the boat. The frames have a longitudinal movement in opposite directions to one another alternately, and the paddles of one frame, as said frame is moving forward, opening and acting as a resistance to the water, and the paddles of the other frame closing and presenting no resistance as said frame is moving backward. By this arrangement no loss of power by back water is experienced, as there is no expenditure of power in entering or leaving the water, as in the case of the common paddle wheel. The paddles are so arranged that they can be set to act as above stated, both when the boat is moving forward or backward, which is a result not heretofore successfully accomplished in side propellers. The invention is very ingenious, and we cannot see why it will not answer well for the purpose intended.]

HEMP BRAKES—George M. Newell, of Lexington, Mo.: I am aware that straight slats, in a horizontally reciprocating frame, in combination with similar stationary slats, have been used previous to the date of my invention. Also that a reciprocating whipper has been used in combination with a reciprocating gate, and other reciprocating devices for breaking hemp. Such devices and combination of devices, therefore, I do not claim broadly.

But I claim, first, Giving the slats of the pivoted frame a curve which is concentric with the axis on which the frame in which they hang reciprocates, and arranging said slats or swords so as to move in curved slots of stationary pillars as the frame reciprocates, substantially as and for the purposes set forth.

Second, The arrangement in the manner specified, below the breaking swords or slots, of two sets of stationary beaters or whipping rods and two sets of reciprocating beaters or rods, the latter being attached to pivoted rocking arms provided with curved slats, so that they shall reciprocate in the path of a vertical circle, and operate in combination with the stationary rods, substantially as and for the purposes set forth.

[By shaping the swords or slats of the reciprocating gates, and giving them a circular reciprocating motion, as defined in the above claims, they have a positive downward action upon the hemp or flax both in their backward and forward motion, and thereby cause the same to be continuously drawn down from the hopper, and to be fed down through the machine without the aid of any auxiliary feed devices; and by arranging reciprocating whipping rods or beaters below the breakers, all the shoves are removed, and thus the perfect operation upon the hemp before it leaves the machine, is ensured. This appears to be a most excellent arrangement for breaking hemp, and we are informed from authority that it works well.]

APPARATUS FOR CLEANING AND POLISHING COFFEE—William Newell, of Philadelphia, Pa.: I claim in combination with the cylinder which contains and furnishes heat to the coffee, the open wire diaphragms or partitions for furnishing rubbing surface, substantially as described.

I also claim in combination with the open wire rubbing surfaces, the flanges and heating tubes, as set forth.

ENDLESS CHAINS FOR THRESHING MACHINES—Job E. Owens, Clark Lane, and E. G. Dyer, of Hamilton, O.: We claim a chain composed of two different kinds of malleable cast iron links, when constructed in all their parts, as represented, for all the purposes mentioned in the specification, and when the alternate links of chains are the duplicates of each other throughout the series, and the two kinds of links united in the manner and for the purposes set forth.

MANUFACTURING KNIT GLOVES—James Peatfield, of Ipswich, Mass.: I do not claim to be the inventor of a seamless knit glove, as such are knit by hand.

But I claim the manufacture of seamless knitted gloves, by knitting the hand and the fingers and thumb separately, and uniting them in the manner substantially as described.

[The object of this invention is to produce seamless knitted gloves by machinery. This is done by knitting the hand of a glove and the fingers and thumb separately, each in circular form, and consequently without seam, and uniting them by knitting them together by hand.]

GOVERNOR FOR STEAM ENGINES—C. T. Porter, of New York City: I claim, first, In combination with arms and balls, or their equivalents, revolving at a much higher velocity than would be natural to them, considered as a conical pendulum, the employment of a counterpoise, applied substantially as described, and so proportioned in weight as to balance, or nearly so, the centrifugal force developed by the revolution of said arms and balls or their equivalents.

Second, I claim so applying the counterpoise to the governor that its effective load shall be lessened as the governor rises, or as the balls and arms thereof or their equivalents expand, for the purpose of rendering it constant, or as nearly so as desired, relatively to the power of the governor to sustain it.

Third, I claim the employment of the counterpoise applied to the governor in any manner substantially as specified, as a means of fixing or adjusting the exact speed of the engine, as described.

[A full description of this improvement appears on page 363.]

REFRIGERATOR—Henry Rehahn, of New York City: I do not claim circulating the air through the ice, and through the refrigerating chamber, as that has heretofore been done.

But I claim, in combination with the ice-box and ventilator arranged near the top of the refrigerator box, the centrally located cold air tube for carrying the cold air from said ice-box down to or near the bottom of the refrigerator, and admitting it into the refrigerating chamber, and in between the inner and outer cases, thence it ascends and escapes through the register, substantially as set forth and described.

MEDICATED VAPOR APPARATUS—Alex. F. Rose, of Brooklyn, N. Y.: I claim, first, The construction of the mask, D, with a marginal cushion, a single or double back as passages, substantially as described.

Second, The construction of masks for encircling the neck or other part, in the manner substantially as represented in Figs. 3 and 4—that is to say, with a band of wire cloth or other sufficiently flexible, but yet sufficiently stiff material, a marginal cushion, g, a passage-box, H, and an enveloping cloth, I, of waterproof, the whole being combined substantially as described.

[By this invention heat or cold fumes or vapors, medicated or otherwise, can be applied as remedial agents to any part of the body which may be the seat of pain or disease. The apparatus consists of a heater or cooler for heating or cooling air or gaseous or æriform body, or a generator for generating steam and other vapor or fume, and a pair of bellows and pipes connecting the bellows with a proper mouthpiece or mask to be directed or applied to any part of the body for the purpose of bringing hot or cold air, vapor, or fume, in contact with the body, to act as a remedial agent.]

GAS GENERATORS—G. W. R. Seal, of Winchester, Va.: I do not claim the use of scraps of iron or of pebbles or pieces of stone in a gas retort to form an extensive heating surface.

But I claim the employment of a secondary movable diaphragm applied within the retort, so as to support a portion of the cellular packing, and to be capable of being raised and lowered with such portion of the packing, substantially as and for the purpose set forth.

[A retort divided into two chambers is employed, in one of which the substance to be converted into gas is made into vapor, and in the other the vapor is converted into permanent gas, by passing through a packing of cellular character, so that it comes in contact with a great amount of heating surface. The invention consists in the employment of this cellular packing of shavings or scraps of copper or its alloys by whose superior conducting powers the vapors are more rapidly heated and decomposed than when pebbles or scraps of iron are employed to form cellular packing in the retorts. An extra diaphragm is also employed in the second chamber to support a portion of the packing, and it is movable to vary the depth of the packing to suit the various materials that may be employed to make the gas.]

CHURN—N. H. Sherburne, of Campton, Ill.: I disclaim the mere rotation of the two parts of the agitator in opposite directions, and also the construction of agitators with movable parts broadly considered.

But I claim the combination of heads, H H', slides, B, blades, C C', and opposite rotating shafts, S S', constructed, arranged and operating substantially as and for the purpose set forth.

GRAIN CLEANING MACHINES—N. H. Sherburne, of Campton, Ill.: I claim the concentric and opposite moving fans, G G, constructed, arranged and operating substantially as described, in combination with the corrugated head of the upper screen, L, the whole operating as specified.

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SCROLL-SAWING MACHINE—E. Sirret, Jr., of Buffalo, N. Y. : I am aware that revolving cranks have been directly connected to the upper and lower ends of reciprocating saws, for the purpose of driving the saws without a frame or sash, but I am not aware that reciprocating bent levers or bell cranks have been employed and arranged as shown and described, for the purpose of operating the saw, and also allowing it to be kept perfectly strained while at work, and readily relaxed when it is to be removed from the machine.

I claim, first, The bent levers or bell cranks, H I, attached to the crossheads, e m, of the saw, K, and operated by the eccentrics, E F, or their equivalents.

Second, Having the upper lever or bell crank, I, attached to an adjustable plate, c, operated by a screw, h, or its equivalent, for the purpose of readily and properly straining the saw and allowing the same to be relaxed and removed with facility from the machine.

[This invention relates to an improvement in that class of sawing machines in which no saw frame or sash is employed, and which are generally known as muley saws. The invention consists in the peculiar manner of hanging and driving the saw, so that it may be readily strained and kept while in operation at a proper degree of tension, and readily removed from the machine when necessary.]

ROLLING RAILWAY CHAIRS—J. H. Snyder, of Troy, N. Y. : I claim forming or turning the tip or lips, A, of the chairs, upon the collar or collars. O, of a roller, E, by means of another roller, D, substantially as set forth.

BUTTER COOLER—James H. Stimpson, of Baltimore, Md. : I do not claim, broadly, the placing of the ice above the butter.

But I claim as an improved article of manufacture a butter cooler made substantially as shown and described, to wit, with an ice receptacle, D, suspended over the dish, B, in the manner and for the purposes set forth.

[A notice of this improvement is given in another column.]

ATTACHING SLEIGH RUNNERS—Wm. W. St. John, of Lima, N. Y. ; I do not claim allowing motion to the hind runner at the bolsters, said runner being drawn along by a connection at its forward end.

But I claim the combination of the T-formed slide, 5, cap, 3, and joint, 4, for attaching the hind runner of sleighs to the body, when said runner is drawn by a connection to its forward end, substantially as and for the purposes specified.

COTTON GINS—Joshua Tetlow, of Taunton, Mass. : I claim the rollers, B B, one or more, grooved as shown, namely, longitudinally and parallel with their shafts, and grooved also in a zig-zag manner in connection with the adjustable stationary plates, S, and vibrating plates, b, arranged to operate as and for the purpose set forth.

[The gins in which this improvement is made are those such as are used for ginning Sea Island or long staple cotton, and the intention is to produce a machine which will gin long staple cotton more expeditiously, and at the same time work in a thorough manner without injuring the fiber in the least. Grooved rollers are used in connection with vibrating plates and adjustable feed boards, arranged so as to operate together and produce the effect desired.]

APPARATUS AS AIDS IN EXTRACTING TEETH—Chas. C. Thomas, of Natchez, Miss. : I claim a dental instrument having the adjustments, substantially as stated and adaptable to the purposes specified.

EARTHENWARE DISHES—Alson Vail and Tracy Vail, of Berlin, Wis. : We claim a new article of manufacture, to wit, a covered dish with an absorbent lining, perforated or unperforated, as specified, for the purposes set forth.

[This invention consists in making dishes porous on their inner surface, so that the moisture shall be absorbed from hot eatables, and the same kept in a dry and palatable condition. To accomplish this result the dish is formed of some porous argillaceous substance and only glazed on its exterior, or if the dish is of chinaware it may be rendered capable of absorbing moisture by being lined with a porous perforated substance. We regard this as a capital improvement; it avoids the deposit of condensed vapor upon vegetables confined, and saves the same from becoming sweaty and having a watery taste.]

REFRIGERATORS—Nathaniel Waterman, of Boston, Mass. : I claim the arrangement of the air supply and discharge pipes with respect to the case and its refrigerating chamber, in which arrangement the supply pipe or pipes are disposed within the refrigerating chamber, while the discharge pipe or pipes are disposed outside of the same in manner as specified.

I also claim the combination of a series of grooves or an auxiliary space or spaces, and a discharge pipe or their equivalents with the metallic bottom or lining of the refrigerating chamber, and arranged under the same and within the case or the stopping or bottom part of such case.

I also claim the arrangement of a space, H, within the cover of the refrigerator, as described, and around the odor discharge pipe, G, the same being to operate in manner and for the purpose set forth.

AUTOMATIC MECHANISM FOR OPERATING THE SURVEYOR'S GRAPHODOMETER—J. M. Wampler, of Baltimore, Md. : I claim the combination with a moving strip of paper, or other proper material, arranged on any suitable vehicle of automatic mechanism for taking and recording distances and courses or distances and levels, or distances courses and levels substantially as described and shown.

SMOKE STACK FOR STEAM VESSELS—Wm. Webster, of Jefferson county, Washington Territory : I claim, first, The arrangement of two or more pipes, D D D, &c., within an outer shell, B, as described.

Second, The application to a double shell smoke stack, of the registers, L L, &c., as and for the purpose described.

SAWMILL BLOCK—Hiram Wells, of Florence, Mass. : I claim operating the dog bar I, of the block C, by means of the lever, K, fitted in the underside of said bar, the ribbed plate, D, connected with the bar, F, by the obliquely slotted plate, E, and pin, b, the whole being arranged and applied to the carriage, substantially as and for the purpose set forth.

[This is an improvement on a former patent granted to this inventor, June 9, 1857. In that invention the dogs of both the head and tail blocks were operated simultaneously by means of a rack bar connected to the dog bars by means of levers, racks, pawls, &c., arranged so as to form a comparatively complicated device. The object of the present invention is to attain the same ends by a simpler arrangement of parts less liable to get out of repair, and more economical to construct.]

TRIPOD-HEAD FOR SURVEYORS—Wm. J. Young, of Philadelphia, Pa. : I claim constructing the head of a surveyor's tripod in such a manner that the portion to which the instrument and plumbline are attached may be adjustable in any direction horizontally to the portion to which the legs are jointed, when the usual leveling screws serve the purpose of binding the two portions of the head together after adjustment, as set forth and for the purpose specified.

LEATHER SHAVING KNIFE—J. B, Wentworth, of Lynn, Mass. : I claim the described leather shaving knife, consisting of a stock, C C', with a bevel only on one edge, extending beyond the center from Y to Z, and provided with screws, e, combined with a blade, D, having slots, d, operating as and for the purpose specified.

SELF-DUMPING COAL BUCKET—John Wust, of Philadelphia, Pa. : I claim the employment of the handle, B B' B'', attached by pivots below the center of gravity of the bucket, in combination with the sliding rod, G H, and the spring bolt, L, or their equivalents, arranged and operating substantially as described.

FLOOR CLAMPS—H. C. Wight, of Worcester, Mass. : I do not claim, broadly, the employment or use of a toggle, for that is a well-known mechanical device.

But I claim the toggle formed of the levers, C D, connected with a screw, B, which passes or works through a pivoted nut, c, in combination with the clawplate, E, and head or jaw, G, attached respectively to the levers, C D, the whole being arranged and connected with the frame, A, substantially as and for the purpose set forth.

[In this invention a toggle is employed in connection with a power screw, claw plate and jaw or pressure plate, the whole being fitted or attached to a proper framing or support, so as to form a powerful, portable and economical clamp suitable for laying floors, or other work in which clamps are usually employed.]

BOOT TREES—A. J. Wisner, of Homer, N. Y. : I claim the combination of shaft, G, bevel wheels, W W', screw, H, nut, I, screw, F, and yoke, b, with the thin shaft, E, and hinged sole, D, the whole constructed and arranged for joint operation, substantially as and for the purpose set forth.

DEVICE FOR SECURING LIGHTNING RODS—Victor Schrage, of Cincinnati, Ohio : I am aware of other attachments being made for the same purpose, and therefore do not broadly claim attaching and detaching rods after this manner.

But I claim the spiral spring, d, as constructed, and arranged to the insulator, a, in the manner and with the means represented for the purposes described.

RADIATOR FOR HEATING BUILDINGS, &C., BY COMBUSTION OF GAS OR ALCOHOL—I. H. Chester, (assignor to Wm. A. Chester), of Cincinnati, Ohio: I claim the radiator constructed with a central opening, C C, in its bottom to receive the flame and heated products of combustion from the burner, and with the surface of said bottom inclining downwards from said opening towards two openings, d d, at the ends and with the wire gauze cylinders or their equivalent, l l, k k, between the slides, by which means combined, provision is made for the condensation and free escape of the water of condensation, together with such carbonic acid as may be absorbed by it.

[The principal object of this invention is to provide for the condensation within the radiator of the water evolved by the combustion of the gas or alcohol, and its escape therefrom, together with a considerable portion of the carbonic acid evolved, which is absorbed by the water, and at the same time to provide for the construction of the radiator in such a manner as to provide for the equal distribution of heat therein.]

MANUFACTURING CHAIR BACKS—S. E. Foster, of Fitchburg, Mass., assignor to Walter Heywood Chair Company : I claim the described rest, consisting of two jaws, which are moved an equal amount on each side of a vertical plane passing through the center of the cutters, as the thickness of the stuff varies in the manner and for the purpose substantially as set forth.

ATMOSPHERIC REGULATOR FOR STOVES, FURNACES, &C.—B. Holly (assignor to himself, and J. T. Edwards) of Seneca Falls, N. Y. : I claim the employment of a pendulum or balance having a movable axis connected with the valve or damper, A, by the levers, C and D, or their equivalents, in such a manner that the gravitating force shall increase as the damper closes, and diminish as it opens, for the purpose of regulating the admission of air to the fuel, substantially in the manner set forth.

I also claim the method of hanging the damper, A, by means of the convex pivot bearing, C, arm, f, and sliding pivot, d, substantially as as and for the purpose described.

SPINNING FRAMES—Amasa Houghton, of Putnam. Conn., assignor to himself, E. D. Draper and George Draper, of Milford, Mass. : I claim the application of the cap to the upright spindle and the holster so as to operate therewith, substantially in manner as specified.

WATERWHEELS—D. K. Kraatz, of Ephrata, Pa., assignor to himself and I. S. Roland, of Bareville, Pa. : I claim the perforated flanch, a', which closes the spaces, between the upper ends of the series of buckets, d d, when the perforations in the said flanch are made to open into a close air chamber, substantially in the manner and for the purpose set forth.

HAND STAMPS—Wm. Morse and John Hughes, of Boston, Mass., assignors to G. H. Devereux, A. F. Devereux. O. W. Barrett and E. E. Barrett, of Salem, Mass. : We claim combining with the stamping mechanism, a cast off mechanism for discharging the letter or article to be stamped from the bed or the cast off over the same.

We also claim combining the pad or cushion, h, with or arranging it directly upon the cast off or plate, K, thereof, substantially as specified.

We also claim the combination for operating the cast off, the same consisting of the arm, r, the tripper, n', the arm, the shaft, L, and the spring, k, the same being arranged and made to act together essentially as specified.

MACHINES FOR CLEANING GRAIN—Wm. H. Orr (assignor to Wm. M. Griffiths), of Martin's Ferry, Ohio : I claim the application of the auxiliary shaft, K, constructed in the manner and employed for the purpose described and set forth.

COOLING CAR WHEELS—Robert Poole (assignor to himself and G. H. Hunt), of Baltimore, Md. : I claim the described process of regularly cooling car wheels, whereby all strain within the wheel is avoided, the chill uninjured, and the web of the wheel is without curve or corrugation, substantially as described.

MACHINERY FOR POLISHING THREAD—Britton Richardson (assignor to himself and the Hayden Manufacturing Company), of Haydensville, Mass. : I claim the construction of the dressing and polishing rollers, with ribs, a a, covered with flannel, felt or material of similar character and arranged relatively to each other, substantially as described to produce elasticity of surface.

[A notice of this improvement is given in another column]

FURNACES FOR MANUFACTURING ZINC OXYD—Joseph Wharton, of Philadelphia, Pa., and Nathan Bartlett, of Bethlehem, Pa., assignors to Joseph Wharton, of Philadelphia, aforesaid : I claim, first, The construction and arrangement of the furnaces of double the usual length, without any separating end wall, and with a charging door to each extremity, in the manner and for the purposes set forth.

Second, The construction and combined arrangement of the conduit, L L', the damper or valves, d and e', and the chimneys, g g g, in the manner and for the purposes substantially as set forth.

Third, The series of tweers, opening into the conduit, L L, arranged and operating as described.

RE-ISSUES.

SEWING MACHINES—John A. Ruckman (assignee of J. E. A. Gibbs), of Millpoint, Va. Dated June 2, 1857—Re-issued July 13, 1858 : First, In the single thread sewing machine, I claim a hook or looper, revolving in one direction only, being so constructed as to make a series of chain stitches, when operating in connection with a reciprocating needle.

Secondly, I claim the peculiar construction, substantially as described, of a revolving hook, whereby, while one loop is taken from the needle by the hook, spread, twisted and held in the path of the needle until another or fresh loop is taken, the former loop shall be released and drawn up during the retreat of the needle.

DESIGNS.

BEDSTEADS—Heinrich Neidig, of New York City. Two cases.

COOKING STOVES—E. J. Delany, of Philadelphia, Pa., assignor to H. E. Marsh, and Jos. Johnson, of Lawrenceville, Pa.

STOVES—N. S. Vedder, of Troy, N, Y., assignor to G. W. Eddy, of Waterford, N. Y.

Pressure upon Fish.

Mr. Pell, in his late address to the American Institute on the subject of fish, says that at ninety-three feet below the surface of the water a shad would be compelled to bear about the weight of sixty pounds to every square inch of surface on its body; at three hundred and sixty-one feet, one hundred and eighty-one pounds; at six hundred and six feet, two hundred and eighty-six pounds; at four thousand two hundred and six feet, eighteen hundred and thirty-one pounds to the square inch; at six thousand feet, over one tun. Whales sometimes descend into the depths of the ocean four thousand nine hundred feet, when they sustain considerably over the enormous weight of two hundred thousand tuns—nearly, if not quite, one hundred and thirty-eight tuns to each square foot of surface exposed. The fish do not, of course, feel this pressure, as it is exerted on all portions of their bodies alike.

How to make Soda Ash.

In an article on this subject a few weeks ago, we did not give credit to Leblanc, the French chemist, who first proposed the method at present adopted in manufacturing that substance. This has aroused the honest patriotism of a French correspondent, who requests us to do this justice to his countrymen. We never had any idea of ignoring the fact, which is so well known, that Leblanc's plan was the one adopted, but he cannot strictly be called "the father of modern alkali making," as the system now carried out by the practical makers is the result of many men's discoveries and inventions, and we still think that Tennant deserves some credit for his genius in adapting and bending to suit Leblanc's process, the resources of Britain, and making it the fountain of alkali for the world.

Recent Patented Improvements.

The following inventions have been patented this week, as will be found by referring to our List of Claims :—

MACHINERY FOR POLISHING THREAD.—B. Richardson, of Haydenville, Mass., has invented an improved machine for dressing and polishing sewing thread and yarn. The invention consists in a peculiar construction and arrangement of flannel covered or felt covered rollers for rubbing down the fibres of, and polishing the thread or yarn after it has been sized.

BUTTER COOLER.—This is an improved article for the table, designed for keeping butter in a cool hard state during meal times in warm weather, and so is especially applicable to the present season. The invention consists in having an ice receptacle supported over a butter dish, so that the butter will be cooled by the cold air which descends upon it, in consequence of being of greater specific gravity than the surrounding atmosphere. James H. Stimpson, of Baltimore, Md., the inventor of the ice pitcher illustrated in our columns two weeks ago, is the patentee.

SHINGLE MACHINE.—E. Hall and J. F. Stewart, of East Randolph, N. Y., have produced an improvement in that class of shingle machines in which a circular saw is used to cut the shingles from the bolt. A peculiar means is employed for feeding and setting the bolt to the saw, whereby the machine is rendered automatic in its operation, or in other words, the bolt when applied or adjusted to the carriage and the machine put into action, is by a continuous operation, without attendance, sawed into shingles of proper taper form.

PILE DRIVER.—This pile driver is constructed in such a manner that the monkey guides may be adjusted in a vertical position in case the ground on which the machine rests is not horizontal, thereby allowing the machine to be expeditiously applied to its work without the trouble of grading. The invention is chiefly designed for driving small piles, fence posts, and the like, but it may be used for heavier work if constructed of proper size. T. W. Loveless, of Corning, N. Y., is the inventor.

IMPROVEMENT IN WATCHES.—In this improved watch the escapement consists of a single escape wheel and two geared balances, with cylinders or cylindrical segments, engaging with the escape wheels on opposite sides of its axis. There is also a compensating device, and the chain is arranged relatively to the barrel and fusee, so that the drag of the chain is on the same side of the axis of the fusee as the resistance to the transmission of the power from the latter, so that the friction on the fusee pivot is much reduced. The two ends of the fusee are arranged in a position the reverse of that heretofore adopted, for the purpose of equalizing, as nearly as possible, the friction in both ends of the barrel and on the two pivots of the fusee arbor when the watch is fully wound. Jacob Muma, of Hanover, Pa., is the inventor.

STOP-MOTION FOR ROTATING KNITTING MACHINES.—This invention consists in a certain mode of combining the sinker wheel or any toothed wheel gearing into and deriving motion from the needles with a movable stop, which is applied to the belt shipper to lock it in a position to hold the driving belt on the driving pulley of the machine as long as the knitting progresses properly, whereby, as soon as the thread breaks, or any of the loops miss, the shipper is caused to be unlocked, and allowed to be moved by a spring, or its equivalent, applied for the purpose, to a position to ship the belt on to a loose pulley, and thus stop the machine. It is the invention of N. P. Aiken, of Troy, N. Y.

GOVERNOR FOR STEAM ENGINES.—C. F. Porter, of New York City, has invented an improved centrifugal governor for steam engines and other motors, the object of which is to obtain the great requisites necessary for a perfect governor, which are as follows: Firstly, that it shall effect the whole of the movement necessary to enable it to open wide and close the regulating valve, or give the full range of variation which the regulator is capable of, with but an unappreciable variation in the speed of the engine or motor; and secondly, that it shall commence to effect the said movement instantaneously, upon the slightest variation of speed, and effect it very rapidly. Neither of these requisites are possessed by the centrifugal governor as ordinarily applied, although, notwithstanding its serious defects, it is generally admitted to be, on the whole, superior to any of the various governors hitherto devised. To obtain these results a centrifugal governor is constructed on any of the usual plans, with balls and arms, but made very much lighter, and instead of giving it only about the number of revolutions in a given time that would be natural to it, considered as a conical pendulum, as has hitherto been customary in the application of centrifugal governors. it is driven at a much higher velocity; and at the slide of the governor which connects it with the regulator, a weight much greater than the weight of the balls and arms is placed, and sufficient to balance, as nearly as possible, the great amount of centrifugal force developed by the revolution of the latter; and it is in the employment of this counterpoise, in combination with the arms and balls rotating at a velocity much higher than their natural one, that the invention principally consists. The invention also consists in so applying this counterpoise to the governor that its effective load on the governor shall be lessened in such a degree as the balls and arms of the governor expand, as to render constant, or as nearly so as desired, relatively to the power of the governor to sustain it. The counterpoise is also employed as a means of controlling the exact speed of the engine or motor.

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New Inventions.

A New Tinning Alloy.

A new method of tinning iron goods, pins, and other articles of a like nature has been invented by M. Fouquet, of the Department of the Eure, France, which consists of an amalgam or alloy fusible at low temperatures, composed of quicksilver and tin, or of tin, lead, and bismuth in equal parts. The heat required being no more than that of boiling water greatly facilitates operations, and the articles, which have to be perfectly cleaned before being plunged into the alloy, are found to present perfectly smooth surfaces when withdrawn from the same.

Improvement in Distillation.

The distillation and rectification of tar, resin, bitumen, turpentine, shistore oil, and other substances, have been improved by M. D'Arcet, with a view to obtain a continuity of action. The principal object of the invention, and of the apparatus employed to carry it into effect, is to render the distillation of the above-named substances, and generally of all liquid hydro-carbons, liquifiable by heat, analogous to that of alcoholic liquids, and to effect this purpose at the lowest possible degree of temperature. The basis of the process may be said to consist in the continuity of the distillation or rectification, and the spontaneous separation of the resulting volatile substances. For this purpose they are placed in an apparatus divided into compartments, to each of which, in succession, increased degrees of temperature are applied. Each compartment is provided with an escapement valve, by which the products of distillation in that degree of temperature are conducted into a separate receiver.

Sprain Cured by Manipulation.

This means of treating sprain, recently revived by Mr. Gerard, is frequently had recourse to by M. Nelaton, the distinguished surgeon of the Clinique Hospital, Paris, with complete success, both in recent and old standing sprains. A case recently presented itself, in which a man sprained his ankle while leaping. Cold water was continuously applied, but he remained unable to walk for three weeks, when he came under Nelaton's care. It having been ascertained to be an example of simple sprain, one of the *internes* slid his fingers under the foot, and having greased the two thumbs, pressed these successively with increasing force over the painful parts, for about a quarter of an hour. The application was repeated several times, and in the course of the day the patient began to walk, and the next day left the hospital. This is a most simple cure for a very frequent accident, and can be applied by the most inexperienced. We would advise those of our readers who may be afflicted with a disruption of any of their ligaments to give it a trial.

Improved Dynamometer.

That disease which annually afflicts our country, and which may truly be called the "show fever," when any one who has an invention of any kind takes it to the State fair, and exhibits it to an appreciative multitude, is quickly coming—the season of exhibitions and fairs will soon be upon us, and we have to call attention to a most useful invention, which will be of great value to the judges who award the prizes.

The invention which our engravings illustrate—Fig. 1 being a front elevation, and Fig. 2 a back view—is a dynamometer of simple and improved construction, the invention of G. and J. W. Gibbs, of Canton, Ohio, and patented by them August 26, 1856. It is suitable, and will, we have no doubt, be extensively used for trying the draft of wagons, plows, reapers, mowers, &c., and the strength of cattle, horses, &c.; in fact, it measures force in nearly all of its thousand applications. It consists, as will be seen on reference to the engravings, of an elliptical spring, the advantages of which over the spiral (usually employed) are too well-known to need recapitulation.

The spring, A, is flattened out at its ends, B, and to the upper branch is attached an index, C, on which two pointers, D and E, moving on an axis, F, indicate the power exerted. One end, B, being attached to the object whose draft is to be tested, the horse or other motive power is attached to the other end, and as the strain comes on the spring it brings the two curves, A, nearer together; in so doing the bar, H, being attached at G to one curve, is pushed up, and being pivoted to a lever, I, on a small gear wheel, J, it turns that partly round, and so moves K, which is rigidly connected to the axis, F. This, of

GIBB'S DRAFT-TESTER AND DYNAMOMETER.

Fig. 1

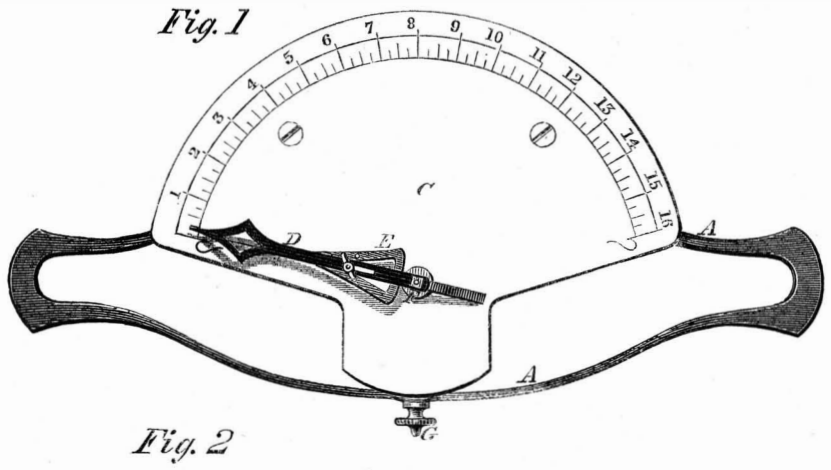
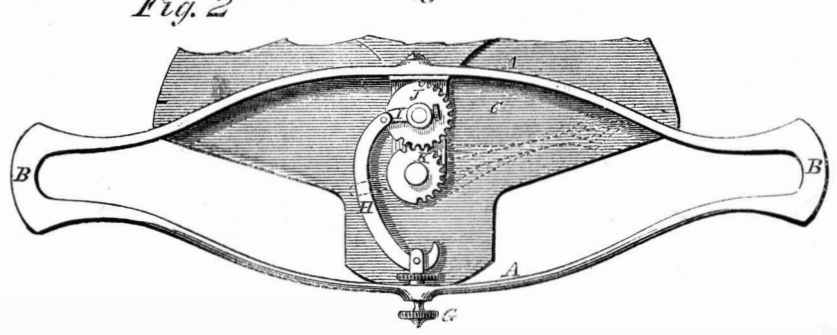


Fig. 2



course, causes the pointer, D, to move round the dial, and the whole being proportioned and graduated correctly, the indicator, E, being only loosely placed on the axis, F, vibrates as the implement to be tested is drawn along, and indicates the average draft very accurately.

It is light, simple, and perfect in its operation, and is manufactured, or the patent is for sale by Gibbs & Danner, of Canton, Ohio, who will give any further particulars. The committee of the Ohio State Board of Agriculture highly commend it; and the Secretary says that "it is the only instrument of the kind he is acquainted with that is at all times reliable."

HARRISON'S DOUBLE-ACTING FORCE AND LIFT PUMP.

Fig. 1

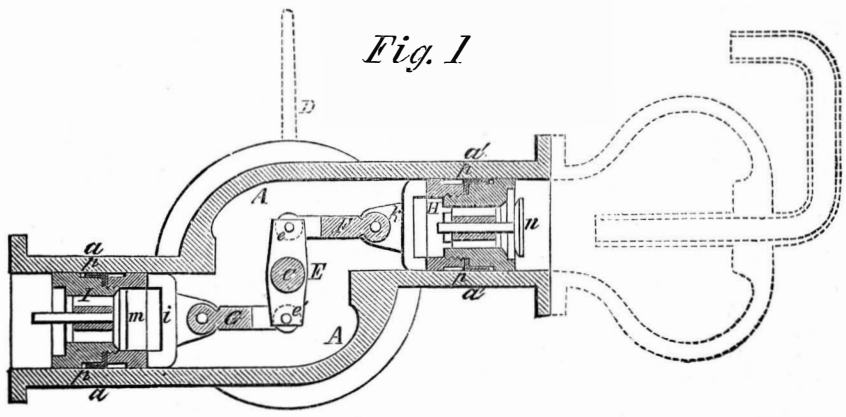
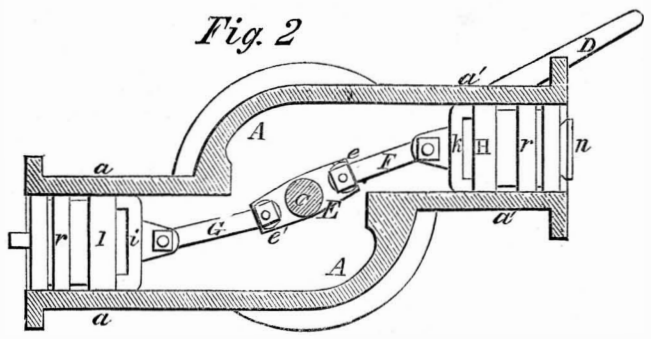


Fig. 2



The great advantage of this pump is that it draws the water directly through itself from the entrance to the exit, and when placed perpendicularly draws the water in a straight column from the bottom to the discharge. It has but two valves, which can be taken out by simply taking the cap off the pump, and as a fire engine for farm houses or manufactories it is admirably adapted. It does not freeze, and is very cheap. The operation is easy and perfect, and it requires little power, as we can testify from a personal trial.

Fig. 1 is a vertical section, showing the buckets at half stroke, and Fig. 2 the same section, with the buckets at the termination of their outward stroke, shown in elevation.

A is the body of the pump, the interior of which forms a chamber, permanently closed on one side, and furnished at the other with a packed cover and stuffing box. Through the stuffing box passes one end of the rock shaft, C, the other being in a bearing on the permanently closed side of A, and the rock shaft has a handle, D, attached to it outside. Secured to the rock shaft is the double lever, E, to one arm of which, *e*, is attached one end of a connecting rod, F, the other arm, *e'*, being jointed to a connecting rod, G, the other end of which is jointed to a bridge, *i*, on the bucket, I, the opposite end of F being also secured to the bridge, *k*, on the bucket, H.

The bucket, I, is arranged to slide in the barrel, *a*, and H in the barrel, *a'*, I, having an ordinary conical valve, *m*, opening inwards, and H a similar valve, *n*, opening outwards, both buckets being formed of two pieces secured together, and furnished with the usual leather packing, *p r*, between.. The interior of the two barrels communicate directly with the chamber, A, and their extreme outer ends are furnished with flanges, to which are secured suitable pipes—the suction pipe to the barrel, *a*, and the force pipe to the barrel, *a'*.

The operation is as follows:—A vibrating motion being imparted to the lever, D, either by hand or power, the buckets, H I, will, through the rock shaft, C, lever, E, rods, F and G, be moved backwards and forwards in their respective barrels, the two buckets invariably moving in contrary directions. Supposing the bucket, I, to be moving inward, and the bucket, H, consequently outward, the valve, *m*, of the former will be closed, and the valve, *n*, of the latter opened, and the water already thrown into the chamber, A, by the previous action of the pump, will be forced through the bucket, H, into the discharge pipe, while the water from the suction pipe is flowing into the barrel, *a*; this is continued until both buckets have reached their extreme inward stroke. The moment the buckets, by the reverse motion of the lever, D, commence their outward stroke, the valve, *m*, will be opened, and the valve, *n*, closed, allowing the water already filling the space in the barrel, *a*, outside its bucket, to rush through the latter into the chamber, A, at the same time, that the water in the barrel, *a'*, outside the bucket, H, is being forced through the discharge pipe.

It will now be seen that in whichever direction the buckets are moved, the water will be directed to the force pipe in a stream, the continuity of which is only momentarily interrupted at the point where the buckets reverse; and even this check may be avoided by attaching the ordinary air vessel shown in dotted lines, Fig. 1. There are no curved passages, so common to double-acting pumps, and all the consequent disadvantages are avoided.

The inventor is W. H. Harrison, of 705 Lodge Alley, Philadelphia, and he may be addressed for further particulars. It was patented June 23, 1857.

Important Surveying Expedition.

A party of United States naval officers have been despatched to the Pacific, to take a survey of the route between San Francisco and China. It is asserted that there are some five hundred islets, shoals, and coral reefs on that route which have never been indicated on a chart; and now that our commerce with China, Japan, and the Indian Archipelago is rapidly increasing, it has become necessary that they should be investigated and delineated. Lieut. Brooke, the inventor of the deep sea sounding lead now in general use in the Navy, is the commander of the expedition, and is accompanied by Lieut. Thorburn, E. M. Kern, the artist who was with the exploring expedition, under Commander Rodgers, to the North Pacific, and several others distinguished for their scientific attainments. After arriving at San Francisco they will proceed in the United States surveying schooner *Fenimore Cooper* to the field of their duties.

ACTIVITY OF INVENTORS.—The warm weather does not depress the genius of our inventors, as we can testify from the business of our own office. During the week ending July 17, we have filed from this office, exclusive of cases filed by our Branch Office at Washington, THIRTY-FIVE applications for patents.

The steamship *Leviathan* has been rebaptized, and is now the *Great Eastern* again.

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Scientific American.

NEW YORK, JULY 24, 1858.

Sun Stroke.

Several of our cotemporaries have been giving some good advice on this subject, and although we think they are wrong in some points, for in our opinion, a sun stroke is actually the result of a rush of blood to the head, suffusing and choking up the brain, and thus producing insensibility and weakness of muscular action, yet in the main they are right. Cold water, bleeding, and other simple means should be tried on a person so affected, and friction to stimulate circulation should be resorted to. When the patient is reviving from the stupor a cup of tea or coffee will aid in restoring perfect consciousness.

Persons in sound health are seldom attacked. Previous debility, general depression of the vital forces, unusual and excessive physical exertion, violent gusts of passion, excessive drinking of cold water, or of alcoholic beverages, superadded to exposure to the summer sun or a hot fire, create the danger. Careful moderation in these particulars will generally secure exemption. The Arab, wandering in an arid desert, subsisting on camel's milk and a few vegetables, usually enjoys immunity; his blood is not vitiated by stimulating food or unwholesome drinking. Fishermen, for the sake of protection, sometimes fill their hats with moist sea-weed, though any large leaves, or even a wet cloth upon the head will answer as well. This is an infallible preventive, and should be more generally observed by laboring men.

The best preventive is, decidedly, temperance, more especially in eating. During the hot weather no person should eat flesh meat more than once a day, and then in small quantities. Highly seasoned dishes are to be avoided, and plenty of good, light, farinaceous food and fruit taken in their stead.

Steam Navigation and John Fitch.

A life of this early American inventor, by Thompson Westcott, just published by Lippencott & Co., of Philadelphia, affords matter for intelligent comment. John Fitch was a native of Windsor, Conn., in which place he was born in 1743. His lot, in many respects, seems to have been surcharged with sadness. From early infancy to the last sad act in his life's drama—when he became weary of the world and put an end to his existence—he seams to have been the subject of misfortune and disappointment. When he attained to manhood he emigrated to Trenton, N. J., and having taught himself to be a watch and clockmaker, also a silver and brass smith, he commenced business for himself, and for a brief space was somewhat successful. But the war of the Revolution having broken out, he was compelled to fly before the British army, sacrificing nearly all his property. On one occasion he was taken captive by the Indians, and retained a prisoner for a considerable time, during which he suffered incredible hardships. After the war of Independence had terminated, and peace had settled down upon the land, commerce and trade began once more to smile upon the mechanic arts. It was then that his inventive mind was directed to improvements in navigation, he having become convinced that some superior mode could be devised for propelling vessels on our noble rivers and lakes than by the old plans of oar, sail, or setting-poles.

It is not generally known that Fitch constructed a steamboat in 1787, which made several trips on the river between Philadelphia and Burlington, N. J. This was eighteen years before Fulton's boat—the *Clermont*—made her first successful trip on the Hudson river.

When it is taken into consideration that Fitch was poor, and that his steam engine and boiler were constructed in a very rude manner, it is a matter of surprise that his boat was able to make a single trip; that it made several does him great credit, as at that early day it completely demonstrated the practicability of steam navigation. Being deficient of means to have a good engine and boat built, he was not able to infuse the same enthusiasm regarding its success which he felt himself. By some he was looked upon as one "beside himself;" and generally he met with sneers where he should have found encouragement. Becoming discouraged at last, he took up his abode at Bardstown, Ky., where he ended his life in 1798. He often said that although his invention was then looked upon as visionary, the time would come when steamboats would be seen on every river of his native land. His prophecy has been fulfilled on a grander scale than he ever dreamed of.

It is not a little remarkable that about the same time as Fitch's experiments were being conducted in America, efforts of a similar character were being carried out in Europe by Patrick Miller, of Dalswinton, Scotland, and neither of these two was aware of what the other was doing. It appears to us that these two cotemporaneous inventors deserve the credit of being original inventors of steam navigation—the one representing the Old, the other the New World. They were the first to demonstrate the practicability of steam navigation; and although they were not permitted to reap the fruits of their inventions, they deserve the honor.

Putrefactive Poisons.

As we have so lately had occasion to refer to that virulent epidemic, the yellow fever, we cannot but be doing service in giving some information concerning the above, the result of investigations conducted by an English gentleman, and communicated by him to the London *Engineer*. There is little doubt that epidemic and putrid diseases owe their origin, in the first instance, to a product of putrefactive fermentation, or that change which goes on in the decay of animal and vegetable substances. Whether this product be a new compound alkaline body, or an organic germ, the one of far greater power than any alkaloid at present known, the other rapidly producing a morbid change in the animal system, or a powerful ferment, volatilized, and carried off by other bodies; its fearful consequences cannot but excite our wonder, and its existence should excite the man of science to study its properties, so that we may place it out of the domain of conjecture into the realms of certainty. By specifying a few examples of the action of "putrefactive poison," we shall be able to more correctly ascertain its nature. The malaria of India, Ceylon, and the Campagna of Rome, the subtle emanations which occasionally follow the course of rivers, the effluvia of marshes, cesspools and drains, and the poisons generated in certain preparations in animal food seem to be but modifications of the same cause. If so, the study of one will afford a key to the whole. Our authority has chosen the *malaria* of Ceylon; let us follow him. This emanation is supposed to owe its virulence to sulphureted hydrogen, but that gas when diluted with air does not produce the effects of *malaria;* so that it is no longer the gas of the laboratory, but has acquired new properties by contact with decaying vegetation. It holds in solution an organic poison, the composition of which analysis cannot reveal. By imitating this process in the laboratory, namely, passing sulphureted hydrogen through water containing putrefying vegetable matter, we find that it has a new odor and peculiar properties. When decomposed by chloride of lime it deposits *carbon* as well as sulphur, and it is probable that the remaining constituent of the poison is hydrogen. If this can be proved, the poison is a true hydrocarbon, and it is probable that it only emanates where there is no growing animal or vegetable life to assimilate it while in an innocuous state, because it has been observed that vegetable as well as infusorial growth lessens the dangerous character of putrefactive poisons. The gases with which this poison assimilates itself, and on whose character much of its virulence depends are the following:—

1 Hydrogen,
2 Sulphureted hydrogen,
3 Carbureted hydrogen,
4 Phosphureted hydrogen.

The study of the properties and peculiarities of these gases assumes therefore an importance which they never possessed before.

Fungi are also known to propagate disease, but when we remember the extraordinary diffusive character of the gases, the growth of fungi as a means of spreading disease falls into insignificance. We think that this chemical theory is the key to the mystery, and it only now remains for some hero of science greater than Alexander, Cæsar or Hannibal, to unlock the door, and make the grandest conquest the world has ever seen, namely, the conquest of man over epidemic disease.

A Prize Architectural Association.

Mr. Simon P. Sleppy, of Wilkesbarre, Pa., proposes the formation of an association for the promotion of the interests of architects upon the following general basis:—Architects who desire to become members to furnish drawings of the choicest structures of their own designing, one per cent of the cost of the building shown in the drawings to be deposited by the designer as a contribution to the funds of the association. The drawings to be properly classified. The money received to be paid, in suitable prizes to the originators of the best designs in each class, a sufficient amount being deducted to pay the expense of annually engraving and publishing the prize plans. The awards to be governed by vote of the members.

With good management an enterprise of this kind would seem to be practicable. An annual volume of architectural designs of the character indicated would be highly useful.

Horseshoeing.

[Concluded.]

One of the great mistakes smiths fall into in shoeing the hind feet is squaring the toe, and placing a clip on each side of it, with a view, as they say, of preventing the horse striking the toe of his hind shoe against the heel of his fore shoe, and producing the disagreeable sound called "forging;" but as a horse never does "forge" with his toe, the plan of squaring it and the reason assigned for it equally fail in their object, and, like many other fallacies connected with the art of horseshoeing, produce the very results they were intended to obviate.

A horse forges by striking the outer rim of each side of the hind shoe, just where it turns backward, against the *inner* rim of the fore shoe, just behind the quarters; therefore the broader the toe of the hind shoe is made by the sqaring and the clips, the more likely the horse is to strike it against the fore shoe. It happens in this way: the horse fails to carry his fore foot forward quickly enough to get it out of the way of the hind foot, and the toe of the hind shoe is thrust into the opening of the still held up fore shoe, and the outer edge of the hind shoe strikes against the inner rim of the fore shoe and produces the sound. I have entirely cured several horses of forging by merely causing the corners of the artificially-squared toe to be removed and the toe restored to its natural form.

The best mode of treating the toe of hind shoe of all horses is to make it rounding and rather pointed, and to turn up a small stout clip in the center: the toe should be tolerably thick, as the wear is always great at this part of the shoe, and the back edge should be rounded with a file, particularly for horses at all likely to be put to fast work; it prevents the chance of "overreach," which, like forging, is often erroneously attributed to the front of the toe, but it is invariably caused by the back edge, which in a half-worn-out shoe becomes as sharp as a razor. The accident is very properly named, for the horse really overreaches the fore foot with the hind foot, and the back edge of the toe of the hind shoe in its return passage to the ground strikes the soft part of the heel of the fore foot, and often produces a wound that is very troublesome and difficult to heal.

The only other portions of the hind shoe which require special attention are the heels. The plan I have adopted for many years past is to have them forged longer and deeper than is commonly done, and when the ragged ends have been cut off, the heels are made red hot, and the shoe placed in the vice with the heels upward and projecting; the smith then hammers them down, to shorten and condense them, until the mass is reduced to about an inch and a-half in length; he then removes the shoe from the vice and makes the top, bottom and sides of the heels flat on the anvil, preparatory to fitting the shoe to the foot, taking care that both heels are of equal height. This plan affords a larger and more even surface of support than mere calkins would do, and is better for fast work; but calkins are very useful for heavy draught, provided they are made of an equal length at each heel. Nothing is more distressing te a horse than working in shoes that bear unevenly on the ground, twisting and straining his joints at every step he takes.

Some horses have a habit of striking the foot or shoe of one side against the fetlock joint of the other side either with their fore or hind feet, and various devices have been at different times suggested as a remedy for the evil; but as each horse has his own mode of doing it, much difficulty is often experienced in hitting upon the right one. I have frequently solved the difficulty by placing a boot or piece of cloth covered with damp pipe-clay over the injured part, and then causing the horse to be trotted along the road, and he generally retnrns with some of the pipe-clay adhering to the offending portion of the opposite foot or shoe, as the case may be, pointing out pretty clearly the part to be lessened or removed. The adoption of this simple plan has saved many a horse from months of torture arising from ill-contrived shoes and misapplied remedies.

As a general rule, horses' shoes should be removed once between each fresh shoeing; but this, like all general rules, admits of exceptions, for if a horse wears out his shoes in less time than a month, they had better not be removed, or if he has a weak, brittle hoof, and does not carry his shoes longer than five or six weeks, they had better remain untouched, as such feet grow horn very slowly, and are rather injured than benefited by frequent removal of the shoes; but a horse with strong feet, who carries his shoes over a month, should have them removed and refitted at the end of a fortnight or three weeks, dependent on the time his shoes are likely to last.

The treatment, or I might almost call it the ill-treatment, that horses' feet receive in the stable requires a good deal of revision, and might very well commence with the all but universal custom of washing the feet and legs with cold water the moment the horses return to the stable from their work, when they are often heated, tired, and exhausted. Nothing can be more injudicious than subjecting them to the sudden chill, caused by a liberal application of cold water to their legs and feet at such a time, and then leaving them to dry as best they can. The amount of cold produced during the process of evaporation is so great, that the poor beasts remain in a state of chilled wretchedness for many hours before they become thoroughly warm again. And as many stables are not provided with hot water at command, the best plan is not to wash them at all when they first come in, but merely to pick out the feet, clean off the dirt, and leave them for several hours, until the circulation has recovered itself and subsided into a natural state, or even until the following morning, when they may be safely washed with cold water, and the delay will do no harm.

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Steam Boilers and Furnaces.

ARTICLE 3.

INCRUSTATIONS.—By the use of hard water for steam boilers, an incrustation or scale is liable to be formed on their interior surfaces which materially injures their efficiency in evaporating steam, and also destroys the metal. So much has been said on this subject, however, in former volumes and in preceding numbers of this volume of the SCIENTIFIC AMERICAN, that we have but little to add new, yet that which we now present will be found very useful and generally new.

In hard water, the *sulphate* and the *carbonate* of lime are the principal matters held in solution that cause incrustations in steam boilers, but the sulphate is the prime scale-former. The reason of this is, that when the water in the boiler becomes saturated with the lime in consequence of the evaporation of pure water which passes off as steam, the sulphate of lime then separates from the water in which it was formerly held in solution, and attaches itself to the whole surface of the metal. The carbonate of lime, on the contrary, although it separates from the saturated water, does not attach itself to the whole surface of the boiler; it is precipitated, but while the water is hot, it has little or no disposition to adhere to the metal unless by cementation with the sulphate. Mr. J. Graham, whose experiments we have described in a former article, was able to prevent the formation of incrustations in boilers when using hard fresh water, by blowing off the saturated water regularly when it has attained to the "salting point," in the same manner that the concentrated brine is run off in the boilers of ocean steamships. In doing this about four per cent of the amount of water fed in is sacrificed, but this is a very small loss in comparison with the good results thereby obtained.

In boilers using sea water, the sulphate of lime is really the only scale which is formed; in those using hard fresh water the scale is chiefly composed of carbonate of lime. Recent experiments regarding both kinds of these boiler incrustations have been described by James Napier, of Glasgow, an excellent practical chemist, in the London *Engineer*. The following is his analysis of scale taken from a boiler in which river water had been used:—

Carbonate of lime	79.0
Sulphate of lime	6.3
Peroxyd of iron	3.5
Silica	2.2
Carbonaceous matter	4.0
Water	5.0
	100.

The next analysis is that of scale taken from the boiler of a steamer running between Glasgow and Liverpool, in which no attention was paid to "blowing off." This scale was composed of two layers; the one (that next the metal) was hard and crystalline, the other (or outer coat) was softer and granular. The thickness of the whole crust was about three-eighths of an inch:—

Sulphate of lime	81.6
Magnesia	4.2
Silica	2.8
Peroxyd of iron	2.4
Salt	0.7
Water of crystallization	7.7
Carbonic acid	0.6
	100.

The next analysis was that of scale taken from the same boiler, which was worked for the same length of time, as in the former experiment, but care was taken to "blow off" regularly. The scale in this case was only one-sixteenth of an inch thick—only one-sixth the thickness of that formed when "blowing off" was neglected:—

Sulphate of lime	94.5
Magnesia	1.5
Peroxyd of iron	0.5
Salt	1.1
Water	2.4
	100.

These analysis show that the sulphate of lime is the main ingredient of the scale deposited by sea water. They also afford very satisfactory evidence regarding the way to prevent incrustations by care in blowing off the saturated water regularly.

The following is the method proposed by Mr. Napier for the prevention of incrustations in all boilers. He analyzes the water to be used, and if found to contain only the bi-carbonate of lime in suspension, there is no difficulty in preventing it from forming scale. The carbonate of lime separates from the water at a high heat, and is kept suspended in the boiler while the water is hot, but when the boiler is stopped, it falls to the bottom in cooling, and when cold it hardens, adheres to the metal, and forms a crust. A boiler using hard fresh water containing carbonate of lime has thus a thin layer of scale formed every night, and at last it accumulates to a thick stony crust, which almost prevents the passage of the heat from the fire to the water. To prevent such scale, the plan to be adopted is simple. In about an hour after the engine is stopped every evening, and when the fire is cooled down, the engineer should blow off the water freely. This will discharge all the sediment which has been precipitated, and prevent it hardening and adhering to the metal.

Although this method of working boilers will prevent scale, if the water only contains carbonate of lime, it will not entirely suffice to prevent incrustations when the sulphate of lime is the principal ingredient in the water, because it does not precipitate like the carbonate. Having by analysis discovered the quantity of the sulphate of lime in each gallon of the water to be used as feed, a sufficient quantity of the carbonate of soda is to be employed to neutralize the sulphate and convert it into the carbonate. The carbonate of soda dissolved is to be fed regularly into the boiler by a pipe connected with the water feed pipe. On land boilers, the carbonate of lime thus formed should be blown off every evening when the water has cooled down; in marine boilers, the carbonate will float near the surface when the boiler is working, and it can be blown off by the surface water cock. Any alkali will neutralize the sulphate of lime in a steam boiler, but the common carbonate of soda is the cheapest which can be used. Care, however, must be exercised not to employ it or any other alkali in excess for such a purpose, as it has a tendency to volatilize with the steam.

Razor Paper.

This article supersedes the use of the ordinary strop; by merely wiping the razor on the paper, to remove the lather after shaving, a keen edge is always maintained without further trouble; only one caution is necessary, that is, to begin with a sharp razor, and then the paper will keep it in that state for years. It may be prepared thus:—

First procure oxyd of iron, (by the addition of carbonate of soda to a solution of persulphate of iron,) well wash the precipitate, and finally leave it of the consistency of cream. Secondly, procure some good paper, soft, and a little thinner than what this journal is printed on; then with a soft brush spread over the paper (on one side only) very thinly the moist oxyd of iron; dry it, and cut into pieces two inches square. It is then fit for use. SEPTIMUS PIESSE.

Recent Patented Improvements.

The following notices of inventions patented last week were unavoidably crowded out:—

PROPELLER ENGINE.—The several direct-acting screw propeller engines hitherto constructed are objectionable in the following particulars, viz.:—The horizontal engines occupy too much space transversely in the vessel to admit of being placed in the run. The vertical engines pass through the decks and project so far above the water line as to be useless for war purposes; and all approved double engines operate on cranks placed at right angles to each other, which involves a series of bearings, much friction, and liability to derangement from the shafts getting out of line. In addition to these imperfections the extreme shortness of the cranks with the attendant great friction on the crank pins and journals, to say nothing of the heavy diagonal thrust of the connecting rods, are serious defects in the direct-acting screw propeller engines now in common use.

To obviate these difficulties, that well-known able, and veteran inventor, John Ericsson, of hot air celebrity, has invented a useful improvement in steam engines for working propellers, which consists in the arrangement of the two cylinders of a double engine in such a manner that their base or bottom ranges with a plane passing through the axis of the propeller shaft or nearly so, in combination with a certain arrangement of rock shafts, crank pins, and connecting rods for imparting motion from the pistons to the shaft, whereby the inventor is enabled, firstly, to bring the cylinders nearer to the propeller shaft, and hence to economize space and construct the frame of the engine of great strength and compactness. Secondly, to avoid the diagonal thrust and friction of the slides, unavoidable when the connecting rod is attached directly to the cross head. Thirdly, to operate the two connecting rods nearly at right angles to each other, which enables the inventor to produce a continuous motion with a single crank on the propeller shaft and a single crank pin in common. Fourthly, to employ a crank on the propeller shaft much longer than half the length of the stroke of the piston, thereby diminishing the heavy pressure on crank pins and journals which has heretofore caused so much trouble by the overheating of the bearings and at the same time diminishing the strain on the engine frame. The inventor resides in New York.

SCREW MACHINE.—Ira Griggs, of Utica, N. Y., has invented a machine for turning the heads of screws and cutting the notches in them, and he has assigned the invention to the Utica Screw Cutting Machine Company. The invention consists in a certain mode of applying and operating a series of screw blank holders in a machine, in combination with a suitable arrangement of the feeding apparatus to supply the blanks to the holders; the turning cutters for cutting the heads and the saw for cutting the notches therein; so that a greater number of blanks can be operated upon in a given time and in a more perfect manner than is ordinarily done. There is also a certain relative arrangement of the driving shaft of the machine, the blank holders, and the rotating stock which contains them, the turning cutters and saw for cutting the notches whereby the driving belt which rotates the blank holders or their axes to turn and finish the heads, is rendered inoperative during the cutting of the notches in the heads. It also consists in a series of rests to support the necks of the screws for the purpose of keeping the heads steady during the action of the turning cutters and saw. There is likewise a peculiar method of applying and adjusting the dies or jaws of the blank holders to make them gripe the blanks and to adapt them to various sizes. An improved method of applying a spring punch in combination with the plunger which operates the jaws or dies of the holder, is employed for the purpose of discharging the screw blanks from the holders by the movement of the said plunger.

WATER GAGE ALARM.— S. W. Warren, of Brooklyn, N. Y., has invented an improved means of operating the valves of alarm water gages, safety valves, and feeders for steam boilers. The improvement consists in a certain method of applying a spring in combination with a valve and with a tube, one end of which is connected with the upper part, constituting the steam space of a boiler, and the other with the lower part of the water space thereof; the said tube being arranged just below the proper water level of the boiler so that it will remain full of water, till the water in the boiler sets below the proper level but at such a distance from the boiler that the water supplied to it by the boiler will never be at as high a temperature as that in the boiler itself, when steam is up in the boiler. When the water gets below the proper level in the boiler, the water leaves the tube and steam fills it and thereby causes an increase in its temperature, by which it is caused to expand longitudinally, and by its expansion made to act upon the spring to move the valve and permit the escape of steam to sound an alarm whistle or to open a feed pipe.

UPSETTING TIRES AND AXLES.—This machine is designed for reducing the diameter of tires without the necessity of cutting out a portion of the same. It is also designed for increasing the diameter of the arms or journals of axles. To accomplish the first result a portion of the tire is compressed or bulged out between two jaws, by means of long levers and the bulged portion then hammered down on an anvil. And to accomplish the second object, the journals of the axles are placed in hollow metal sockets and then crowded by the jaws and eccentric levers until the journals are shortened and increased in diameter. This appears to be quite a useful invention as it places in the hands of every country blacksmith a cheap, simple implement with which he can upset tires and axle journals in a very short time. Zena Doolittle, of Perry, Ga., is the inventor.

CANAL BOATS.—This invention which is clearly defined by the claim is designed for avoiding a serious inconvenience experienced in running canal boats from the stern being sunk down below the bow by the weight of the engine, &c., when the bow portion is not loaded and of the boat being thrown off an even keel, said inconvenience being the blowing round by the wind of the bow portion of the boat and the consequent impossibility, very often, of keeping the boat in a direct course. We regard this as a good contrivance. It was patented by Jas. E. Gibson, of Port Carbon, Pa.

BORING MACHINE-—This invention provides a drill stock which will receive two sizes of augers and drive a large auger with a slow speed and a small auger with a fast speed. The arrangement is very compact, and with it the expense of having two separate boring machines, one to bore light and the other heavy work, is avoided. We view the invention as one of merit and utility. It is the invention of L. A. Dole, of Salem, Ohio.

SLEEPING CAR.—Zenas Cobb, of Chicago, Ill., has invented an improved sleeping car in which four persons can comfortably sleep in the same space that they occupy when sitting in the car by day. This is effected by having the seats and backs to slide on ways until they meet, thus forming a bed for two, and also having two shelves to be capable of adjusting so as to form a bed for two more. In the day time the shelves form extra backs to the seat. There is also provided a table which will fold up out of the way, or on which, when brought down betwen the seats, bundles may be placed or meals served.

STONE GATHERING MACHINE.—This invention consists in having a receptacle or box mounted on wheels and having an inclined plane at its front end; the wheels of the box have rods attached, which are also connected to a scraper that works over the inclined plane and which scraper, by means of spring or drop guides in connection with the rods, is made, as the machine is drawn along, to draw up stones into the receptacle or box. This most useful machine is the invention of G. W. Bishup, of Brooklyn, N. Y.

MEASURING FAUCET.—This invention consists in the employment of rotating cylinders provided with followers arranged in such relation with the tube of the faucet, and connected with suitable mechanism, with an index, springs and cut-off, so that liquids may be drawn from a vessel in measured quantities. Gilbert Hubbard of Montville. Mass., is the inventor.

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Correspondents

S. K. & J. A. Moore, of Mount Jackson, Va., wish to correspond with bolt and nut manufacturers.

J. B. M., of N. Y.—The method of affixing wooden profile letters to stone is by applying white lead, ground in oil, as it comes from the keg, to the back of the letters, and pressing them against the wall, to prevent the lead from losing its adhesive qualities, on account of the absorption of the oil by the stone. Ascertain where the letter is to be placed, and form a rough outline of the letter on the stone with any oil color, and when dry apply the letter. The colorshould have gypsum as a dryer.

P. S., of ——.—We think that the reasen why you have been able to explode kerosene is because alcohol has been mixed with it as an adulteration. Kerosene itself can scarcely be called explosive, and we have never heard of any accident resulting from its use.

P. R., of N. Y.—Your theory of accounting for the fact that water exerts more power on a water wheel at nightthan in the day time, by assuming that the air is lighter, and consequently a cubic foot of water weighs more than in the daytime, can scarcely be correct, for even supposing such to be the case, the wheel and machinery, or the resistance to the action of the water would also increase in the same proportion; so we must try and discover some other reason.

C. S. G., of N. Y.—You will find articles on roofing cements on pages 286 and 294 of the present volume, Sci. Am.

S. S. W., of Ky.—The best work you can get for your purpose is Dana's "Manual of Mineralogy," published in New Haven; it will give you more information than any book we know. You had better get the specimens from some friend in Louisville, where we should think plenty are to be procured.

W. B. B., of Ill.—If you buy the right to use a machine in a certain county, of course you cannot use it in a county that you did not purchase.

B. D. J., of Pa.—Vessels and pipes lined with glass, porcelain, &c., for the purposes you name, are well-known. You could not obtain a patent therefor.

A. H. L., of Wis.—The rule which you have applied to calculate the horse-power of your engine is correct, except that you should have allowed 20 per cent for the difference of pressure between the boiler and the cylinder.

W. H. Smith, of Newport, R. I., wishes to correspond with parties that have machinery for inserting card teeth, No. 12 or 14 wire, through two or three-ply rubber belting, 12 or 14 inches wide.

W. H. S., of R. I.—The cotton is picked from the pod in the field, leaving the boll on the stalk. See engraving of a cotton harvester on page 280, this volume, Sci. Am. We have concluded to give you a three-column engraving.

G. W. McQ., of Tenn.—A stream of water of 64 cubic inches, moving at a velocity of 5 feet per second, has a nominal power of 13-1,000 of one horse-power; and the same stream, moving at a velocity of four feet per second has 1-100 of one horse-power. This is ascertained by calculating the weight af 64 cubic inches of water, which is equal to a little less than 1½ lbs., (accurately equal to 1.459 lbs.) multiplying this by the velocity in feet per second, and dividing by 550. It is impossible to use a stream of water having only five feet velocity on a fall of 36 feet, or on a fall of 18 feet. A heavy body falling over a hight of 36 feet acquires a velocity of 48 feet, and it accomplished this in 1½ seconds; the same body falling over 18 feet acquires a velocity of 34 feet in little over one second. It will always have a bad effect if the water is brought in a chute on the wheel, as the percussion or the impact thus effected causes a reaction which retards the motion of the wheel. To lay down the rules for the construction of a water wheel for a given quantity of water at a given fall would take more space than we can spare in one number of our paper. Numbers of books have been written on this subject. We would only remark that for high falls over 30 feet a turbine wheel is always the best.

W. H. T., of C. W.—Butter is produced by the oxygen of the air being brought into contact with the fatty substance of the cream. The shortest way to make butter is not the best. The cream should be kept in an airy apartment, and when churning the cream should be at a temperature of 60 degrees.

A. M. S., of Mass.—We have carefully examined your sketch of the sash-fastening, and are sorry to state that it does not contain any patentable features. Substantially the same device has frequently passed through our office.

C. M., of Kansas.—We have examined the rough sketch of your plan for a method of steering vessels, and cannot discover anything of a patentable character in any of its parts. We would not, therefore, advise you to prosecute it any further.

J. P. & Co., of Pa.—The best method you can adopt to consume your smoke is to request the stoker, every time he "fires up," to push the red-hot fuel to the back of the grate, and then to place the new fuel on the front, give the bars a rake, and never by any chance throw damp fine coal or tan on the top of hot and burning material. This, we suspect, is the cause of your smoke.

N. H., of Ohio.—We have examined your sketch of feed gear for muley saw, and are of opinion that it is not patentable. We have seen substantially similar devices.

S. E., of Ill.—We have carefully examined your model of a clothes' washing machine, and would state so much has been done in this line that at this late day it is extremely difficult to say anything regarding its patentability. We have seen the same idea carried out in various ways. We would suggest that you should have a preliminary examination made by us at Washington. In such cases, where so many patents exist, it is always advisable.

Money received at the Scientific American Office on account of Patent Office business, for the week ending Saturday, July 17, 1858:—

T. H., of Ohio. $30; J. L. F., of Texas, $65; C. W. & W. W. M., of Ill., $25; T. F., of Mo., $60; H. & M., of Pa., $10; W. H. Van G., of N. J., $20; S. D. C., of Wis., $250; A. S., of Ill., $35; T. E. S., of Pa., $25; A. F. & J. H. A., of Conn., $30; E. G. A., of Conn., $25; J. P., of Ohio, $25; R. M. T., of Mich., $30; H. C. S., of Ohio, $5; P. & H., of N., Y., $25; F. K., of N. Y., $25; J. B., of N. Y., $15; J. W. H., of R. I., $73; J. A. T., of Ohio, $25; R. M., of N. Y., $30; A. F., of Ohio, $20; A. P., of Tenn., $30; E. G. G., of N. Y., $25; W. A. M., of Minn. Ter., $30; W. M. W., of N. Y., $50; D. C. R., of Ill., $27; G. W., of N. Y., $30; A. J. D., of Cal., $25; E. W. K., of Ill., $25; N. T. S., of Mass., $55; W. N. T., of Iowa, $30; H. & H., of N. Y., $25; J. R. F., of Ohio, $25; A. T., of N. J., $25; J. B. B., of Conn., $33; F. B., of Conn., $30; T. S., of Pa., $100; W. N. W. Jr., of Ohio, $25; J. M., of Miss., $20; J. O., of N. Y., $250: J. H. W., of Wis., $25; F. G., of L. I., $32; B. O., of Ohio, $30; P. R. L., of S. C., $30; A. M. H., of N. Y., $25; T. R. R., of Ohio, $25; E. S., of La., $35; J. D. F., of Conn., $20; O. H. S. B., of Ind., $30; M. M. of L. I., $25; O. S., of L. I., $25; W. W., of Conn. $56.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, July 17, 1858:—

E. G. G., of N. Y.; W. N. W. Jr., of Ohio; F. G., of L. I.: D. C. R., of Ill.; F. K., of N. Y.; F. B., of Vt.; H. C. F., of Pa.; W. M. W., of N. Y.; J. B., of N. Y.; E. W. K., of Ill.; J. D. F., of Conn.; W. W., of Conn.; C. W. & W. W. M., of Ill.; T. F.. of Mo.; A. G. D., of Conn., F. & B., of Wis.; A. J., of N. J.; A. J. D., of Cal.; O. S., of L. I.; J. P., of Ohio; T. B. B., of Conn.; H. & H., of N. Y.; K. & F., of Texas; J. W. H., of R. I.; A. F., of Ohio; M. M., of L. I.; J. H. W., of Wis.: T. E. T., of Pa.; E. G. A., of Conn.; A. M. H., of N. Y.; E. S., of La; T. R. R., of Ohio; G. C., of N. Y.; H. C. S., of Ohio; J. R. F., of Ohio.

Literary Notices.

Bibliotheca Sacra. W. F. Draper, Andover, Mass. This most valuable periodical for the present month contains a number of articles which show the power of its contributors to their full advantage, the best being "The Greek Church," by Rev. J. M. Manning, of Boston, and "Was Peter in Rome and Bishop of the Church at Rome," translated from the German of Ellendorf, by E. Goodrich Smith.

Charleston Medical Journal and Review. J. Dickson Burns, M. D., Charleston, S. C. The bi-monthly number for July contains a portrait of Prof. Meigs, of Philadelphia, and many articles of interest not only to the medical world but to the general public also. There is a candor, openness and honesty about this journal which pleases us much, and in our opinion it is one of the first publications of its kind in the world.

The Cincinnatus. Farmers' College, College Hill, Ohio. This periodical, designed to promote scientific agriculture and pomology, and also to inculcate a higher taste in science and art among agriculturists, is improving rapidly; and as the subscription is very low we heartily recommend it.

New Orleans Medical News. Edited by D. Warren Brickell, M. D., and E. D. Fenner, M. D. The July number of this valuable periodical contains much matter which is of interest to the faculty, and all the medical news that is worth hearing in the South.

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Receipts—When money is paid at the office for subscriptions, a receipt for it will always be given; but when subscribers remit their money by mail, they may consider the arrival of the first paper a *bona fide* acknowledgment of the receipt of their funds. The Post Office law does not allow publishers to enclose receipts in the paper.

Patent Claims—Persons desiring the claim of any invention which has been patented within fourteen years, can obtain a copy by addressing a letter to this office, stating the name of the patentee, and date of patent when known, and enclosing $1 as fee for copying.

TERMS OF ADVERTISING.

Twenty-five cents per line each insertion. We respectfully request that our patrons will make their advertisements as short as possible. Engravings cannot be admitted into the advertising columns.

*** All advertisements must be paid for before inserting.

TO GAS COMPANIES—WANTED BY A young man a situation as superintendent of gas works; is practically acquainted with the manufacture of gas in all its branches; is also acquainted with the manufacture of meters and all gas apparatus. Satisfactory references given. Address ENGINEER, care of Dr. Deck, 18 Exchange Place, New York.

THE "COUNTRY GENTLEMAN"—THE best of the agricultural or horticultural papers for any latitude or locality is published weekly, each number containing sixteen large quarto closely printed pages, at the low price of $2 a year, by
LUTHER TUCKER & SON,
Albany, N. Y.
N. B.—A new volume begins July 1st. Send for a specimen number.

IMPORTANT TO IRON AND BRASS FOUNDERS—After a series of experiments I have invented a method of constructing molds for iron, brass or other metals, which can only be cast at a high heat, of cheap material, easily obtained in any section, and as easily worked or constructed as any ordinary mold of sand. Many thousand casts may be made from these molds without any risk of injury, if properly managed; they are not likely to blow, or get out of order. They can be worked with great rapidity (once every 2 minutes if necessary), which fact renders them very valuable to malleable iron workers. My charge for the recipe, with full directions, is $10, accompanied by an obligation from the applicant to entire secrecy. A liberal discount will be made to those wishing to buy exclusive territory—States or towns. Letters Patent will be applied for. Address,
W. HUDGIN, Practical Chemist,
Bowling Green, Va.

LATH MILL—J. H. BACHELDER'S PATent. State and County rights for sale. For description see Sci. Am., Vol. 13, No. 29. Address
SAMUEL COMBS,
Hudson, Mich.

IMPORTANT TO INVENTORS.

AMERICAN AND FOREIGN PATENT SOLICITORS.—Messrs. MUNN & CO., Proprietors of the Scientific American, continue to procure patents for inventors in the United States and all foreign countries on the most liberal terms. Our experience is of twelve years' standing, and our facilities are unequaled by any other agency in the world. The long experience we have had in preparing specifications and drawings has rendered us perfectly conversant with the mode of doing business at the United States Patent Office, and with most of the inventions which have been patented. Information concerning the patentability of inventions is freely given, without charge, on sending a model or drawing and description to this office.

Consultation may be had with the firm, between nine and four o'clock, daily, at their principal office, 128 Fulton street, New York. We have lately established a Branch Agency on the corner of F. and Seventh streets, Washington (opposite the United States Patent Office). This office is under the general superintendence of one of the firm, and is in daily communication with the Principal Office in New York, and personal attention will be given at the Patent Office to all such cases as may require it.

We are very extensively engaged in the preparation and securing of patents in the various European countries. For the transaction of this business we have offices at Nos. 66 Chancery Lane, London; 29 Boulevard St Martin, Paris; and 26 Rue des Eperonniers, Brussels. We think we may safely say that three-fourths of all the European patents secured to American citizens are procured through our Agency.

Circulars of information concerning the proper course to be pursued in obtaining patents through our Agency, the requirements of the Patent Office, &c., may be had gratis upon application at the principal office or either of the branches.

Communications and remittances should be addressed to
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No. 128 Fulton street, New York.

The annexed letter from the late Commissioner of Patents we commend to the perusal of all persons interested in obtaining patents:—

Messrs. Munn & Co.—I take pleasure in stating that while I held the office of Commissioner of Patents, more than one-fourth of all the business of the office came through your hands. I have no doubt that the public confidence thus indicated has been fully deserved, as I have always observed, in all your intercourse with the Office, a marked degree of promptness, skill, and fidelity to the interests of your employers.
Yours, very truly, CHAS. MASON.

STEAM WHISTLES—IMPROVED PATterns for locomotive and stationary engines. A large assortment constantly on hand. Manufactured by HAYDEN, SANDERS & CO.,
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ECCENTRIC SCREW AND GRIPPING WRENCH—Hyde's patent—for sale by all hardware stores. Proprietors, GRAY BROTHERS, New York City.

THE SUBSCRIBER HAS ESTABLISHED the manufacture of his Self-straining Saw Mill Irons, at Chicago, Ill. Letters addressed to him at Chicago for the next three weeks will receive personal and prompt attention, if accompanied with a stamp.
July 6, 1858. S. E. PARSONS.

HARRISON'S 20 AND 30 INCH GRAIN Mills constantly on hand. Address New Haven Manufacturing Co., New Haven, Conn.

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5,000 AGENTS WANTED—TO SELL four new inventions. Agents have made over $25,000 on one. Better than all other similar agencies. Send four stamps and get eighty pages particulars, gratis. EPHRAIM BROWN,
Lowell, Mass.

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Treasurer and Superintendent.
For sale by the UNITED STATES VULCANIZED GUTTA PERCHA CO., No. 66 Liberty street, New York.

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These machines have no rival.—[Scientific American.

WHEELER & WILSON'S SEWING MA- CHINES, 343 Broadway, New York, received the highest premiums awarded in 1857 by the American Institute, New York; Maryland Institute, Baltimore; and at the Maine, Connecticut, Illinois, and Michigan State Fairs. Send for a circular containing editorial and scientific opinions, testimonials from persons of the highest social position, &c.

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N. B.—For low falls of one, two, or three feet, also for any fall, it will surpass all others.

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VAIL'S SPEEDWELL IRON WORKS, Morristown, N. J., manufacture Craig's Patent Double-acting Balance Valve Oscillating Steam Engines both stationary and portable, Knowles' Patent Muley, Portable, Gang and Re-sawing Mills, Sugar and Chinese Cane Mills and Sugar Pans, Grist Mills, Mill Irons, Rich's Water-wheels, Forgings and Castings. Orders for the above, and all descriptions of labor-saving machinery will receive prompt attention.
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CORLISS' PATENT STEAM ENGINES—About 250, most of them from 40 to 400 horse power, are now in operation. On application, pamphlets will be sent (by mail), containing statements of responsible manufacturing companies where these engines have been furnished, for the saving of fuel, in periods varying from 2½ to 5 years. Boilers, shafting, and gearing.
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PATENT OFFICE MODELS CAREFULLY made on scientific principles, at low prices, by H. SHLARBAUM & CO., 300 Broadway, New York. References at the office of this paper.

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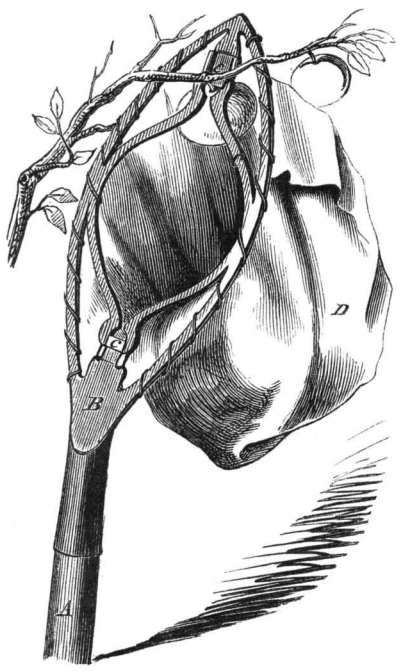
Science and Art.

Important Improvement in Bank Note Printing.

We are glad to chronicle, says the New York *Independent*, the discovery of a chemical process by which the photographing of bank bills, checks, bonds, and certificates can be prevented successfully. The discovery was made by Mr. George Matthews, one of the chemists employed by the Montreal City Bank, who has taken out patents not only in Canada but in the States. The discovery is of a calcined green oxyd of chromium, which produces a green tint, and this being mixed with the black carbon ink, produces an impression which is unalterable. Every possible chemical test has been applied to the erasing of the impression, but not one has been successful, the black impression and the paper itself being destroyed where the green tint is. Professor Henry, of the Smithsonian Institute, B. Silliman, Jr., Dr. Torrey, and other scientific men, have all testified to the perfect security afforded by the "patent green tint and black carbon ink." The newest bank bills, the new issues of treasury notes, the specie certificates employed by the banks in their Montreal exchanges, are all printed in these two permanent inks. The American Bank Note Company now uses it, as it has of late been used by Rawdon, Wright, Hatch & Edson. It is hardly twelve months since the patent was obtained, yet it is rapidly coming into exclusive use for bank note and stock certificate printing. The red ink which has been so much in use is found no longer available, as it can be photographed without injuring the bill. The green tint and black ink cannot be photographed without doing so, in all cases and circumstances. The claim is to the use of the calcined green oxyd of chromium for making ink for printing from engraved plates and other objects.

Goodwin's Fruit Gatherer.

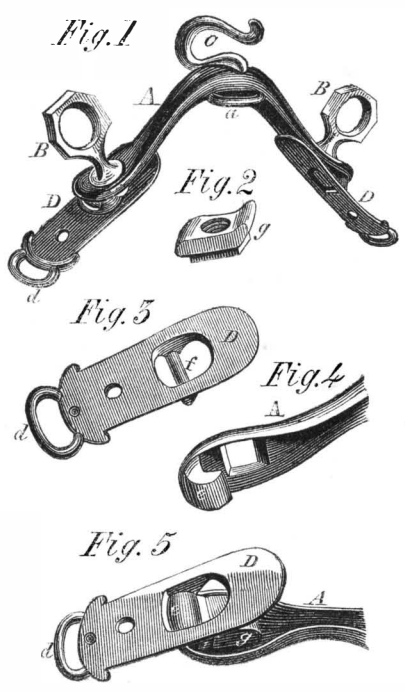


A great quantity of fruit is spoiled in the gathering, by being allowed to drop on the ground, or else the tree is much injured when they are violently pulled off by hand, as the small branches are liable to be broken. This simple little device, cheap and light, is one of the best we have seen for gathering fruit, neither spoiling it or damaging the tree. Any child can use it, and every one who gathers fruit should.

It consists of a light frame of cast iron, B, to which a bag is stitched, and it is placed on a pole, A. In recesses at each end of B is placed a small cutter, *c* and *e*, so that all the operator has to do is to pass the device round the fruit, and in pulling it down or pushing it up, the knife cuts the stalk of the fruit, which drops undamaged into the bag. The fruit gathering season is coming on, and all who want to know more concerning this convenient little assistant to the orchard labors, should apply to the inventor, F. Goodwin, of Astoria, L. I. A patent was obtained November 10, 1857. They are for sale by Belcher & Haviland, 246 Pearl st., New York.

Improvement in Harness Trees.

This harness tree is constructed entirely of metal, and it will operate equally easy on any horse. It is durable, neat, and plain, and can be furnished cheaper than the adjusting trees now in use.



Our engravings illustrate the invention very fully, Fig. 1 being a perspective view of the whole, when put together. A represents the tree, having terrets, B, a rein hook, C, and crupper loop, *a*. On each end of A is cast a hook, *e*, seen in Fig. 4, which hooks over a cross bar, *f*, cast above a hole in the pad, D, Fig. 3, that has loops, *d*, to support the tugs. A nut, Fig. 2, having a projection, *g*, secures the terret to the tree, and in the space left in the hollow of this projection and the space under the hook, *e*, the cross bar, *f*, works—as seen in Fig. 5.

It will be observed, from this arrangement of the parts, that the pads must fit the back of any horse, as they have free play, and the weight of the shafts and tree is always properly distributed over the horse's back.

The inventors are F. B. Kuchnhold and D. B. Sturges, of Newark, N. J., where they may be addressed, at the Hedenberg Works, for further information. It was patented February 16, 1858.

How Gold Lace is made.

In an interesting description of the method of manufacturing gold lace, an exchange pointedly says that gold lace is *not* gold lace; it does not deserve this title, for the gold is applied as a surface to silver. It is not even silver lace, for the silver is applied to a foundation of silk. The silken threads for making this material are wound around with gold wire so thickly as to conceal the silk. The making of this gold wire is one of the most singular mechanical operations imaginable. In the first place, the refiner prepares a solid rod of silver about an inch in thickness, he heats this rod, applies upon the surface a coating of gold leaf, burnishes this down, applies another coating, burnishes this down, and so on, until the gold is about one-hundredth part the thickness of the silver. Then the rod is subjected to a train of processes which brings it down to the state of fine wire, and it is passed through holes in a steel plate, lessened step by step in diameter. The gold never deserts the silver, but adheres closely to it, and shares all its mutations. It is one-hundredth part the thickness of the silver at the beginning, and it maintains the same ratio to the end. As to the thinness to which the gold-coated rod of silver can be brought, the limit depends on the delicacy of human skill; but the most remarkable example ever known was brought forward by Dr. Wollaston. This was an example of solid gold wire, entirely free from silver. He procured a small rod of silver, bored a hole through it from end to end, and inserted in this hole the smallest gold wire he could procure. He subjected the silver to the usual wire-drawing process, until he had brought it to the finest attainable state, being, in fact, a silver wire as fine as a hair, with a gold wire in its center. To isolate this gold wire, he subjected it to warm nitrous acid, by which the silver was dissolved, leaving a gold wire one-thirty thousandth of an inch in thickness—perhaps the thinnest round wire that the hand of man ever produced. But this wire, though beyond all comparison finer than any employed in manufactures, does not approach in thinness the fine film of gold on the surface of silver in gold lace. It has been calculated that the gold on the finest silver wire for gold lace is not more than one-third of one-millionth of an inch in thickness, that is, not above one-tenth the thickness of ordinary gold leaf.

Lord's Perch Coupling.

The king bolt by which the axles of vehicles are connected to the body, and on which they turn, is a very inconvenient appendage, not on account of the space which it occupies, or its shape, but from the fact that it is very liable to break; and as a vehicle changes its center in turning a curve, the king pin being rigid, does not allow the center to change, so that the vehicle is very liable to overturn when rounding a sharp angle. This invention obviates these difficulties, and compels the perch always to traverse the axle, thereby adding to its strength, and lessening the liability to upset, while at the same time it greatly reduces the circle in which the buggy or other vehicle can turn.

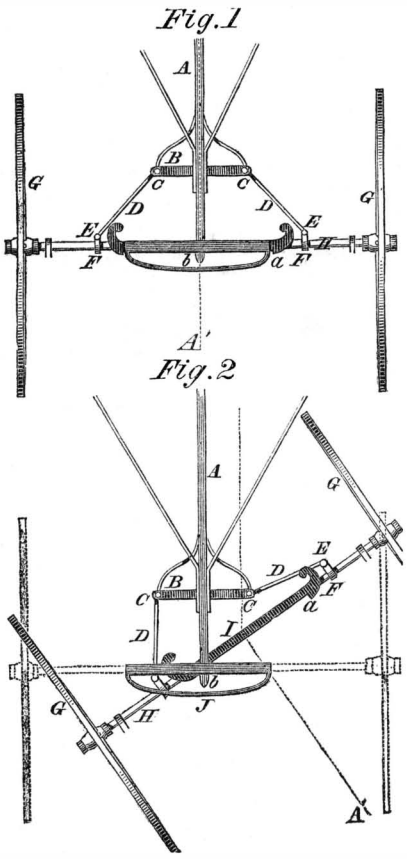


Fig. 1 shows the perch and front axle of a buggy when straight, and Fig. 2 shows the same when turning a curve, the lines, A A', illustrating the deviation from the center, which the king pin will not allow. A is the perch, the end of which, *b*, slides on a metal plate, I, that has catches or projections, *a*, to prevent the perch sliding too far, and it is secured on to the front axle, H. G are the wheels. To the perch is attached a cross bar, B, to each end of which is pivoted, by pivots, C, a lever, D, also pivoted at E to clips, F, which are firmly secured to the axle, H.

It will be seen from the illustration that a steady draft is obtained, and the pull is always directed in the best manner to turn the vehicle in the way desired.

This efficient coupling is the invention of W. S. Lord, of Pulaski, Tenn., and was patented by him October 28, 1856. Any further particulars can be obtained from the agent, E. G. Chant, corner of Broadway and Broome st., New York.

All Animals Can Talk.

At an annual meeting of the Association for the Advancement of Science held in at Boston, it was shown that, after all, there are no *dumb beasts!* Dr. Gibson read a very interesting paper on the *language of animals.* He said that every variety of animated being possesses some means of intelligible communication. Each creature by sounds or signs of correspondence has a language understood by its own kind, and sometimes learned by others. Emotions of caution, affection or fear—of joy, gratitude and grief—are disclosed by simple tones of voice, or by impressive gestures to signalize feelings strictly comprehended and often answered. Insects and birds, fish and beasts thus express themselves in distinct languages, signed, spoken and sung, seen, heard and felt. He illustrated his theory by stating familiar facts relative to domestic animals.

Metallic Compound.

Mr. W. Sharman, of Sheffield, England, proposes to manufacture ornamental articles of a compound of from 35 to 90 per cent of the finest zinc with from 10 to 65 per cent of fine tin. The zinc is first melted, and the tin gradually added, the whole being thoroughly fused is stirred, and the alloy thus formed is rolled after the manner of ordinary zinc and afterwards annealed.

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